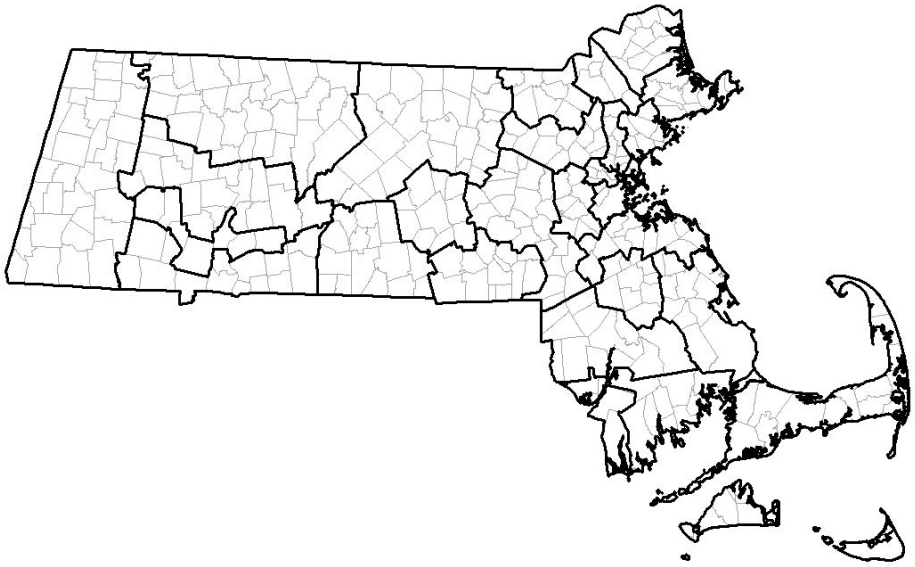
Injury Atlas

A Geographic Reference of Massachusetts Injury Rates

1992 - 2002



Massachusetts Department of Public Health
Center for Health Information, Statistics, Research and Evaluation
Injury Surveillance Program

February, 2005

Injury Atlas

A Geographic Reference of Massachusetts Injury Rates

1992 - 2002

Mitt Romney ~ Governor
Kerry Healey ~ Lieutenant Governor
Ronald Preston ~ Secretary of Health and Human Services
Christine C. Ferguson ~ Commissioner of Public Health
Sue Thomson ~ Deputy Commissioner of Public Health

Center for Health Information, Statistics, Research and Evaluation
Jerry O'Keefe ~ Acting Director
Bruce Cohen ~ Acting Director
Holly Hackman ~ Director, Injury Surveillance Program

February, 2005

ACKNOWLEDGEMENTS

This report was prepared by the staff of the Injury Surveillance Program, Center for Health Information, Statistics, Research and Evaluation, Massachusetts Department of Public Health.

Injury Surveillance Program:

Holly Hackman, Director*

Kate Chamberlin, Research Assistant
Daksha Gopal, Research Analyst
Beth Hume, Project Director
Laurie Jannelli, Site Coordinator
Loreta McKeown, Research Analyst
Bridget Nestor, Administrative Assistant
LaVonne Ortega, Project Director
Victoria Ozonoff, Senior Research Advisor
Veronica Vieira, Research Analyst*
Steven Wang, Research Assistant

* Provided primary development, analysis, and authorship of this report.

To obtain additional copies of this report, contact:

Massachusetts Department of Public Health
Center for Health Information, Statistics, Research and Evaluation
Injury Surveillance Program
250 Washington Street, 6th Floor
Boston, MA 02108
617-624-5663

To obtain more data on injuries to Massachusetts residents, contact Beth Hume at the Injury Surveillance Program (617-624-5648), or on-line at:
http://www.state.ma.us/dph/bhsre/isp/isp.htm

For information on how to prevent injuries, contact Cindy Rodgers at the Injury Prevention and Control Program (617-624-5413), or on-line at:
http://www.state.ma.us/dph/uninj/inj.htm

For other Department of Public Health data, register for MassCHIP, the Department's FREE internet-accessible data warehouse:
http://www.state.ma.us/dph/ose/mchphome.htm

This publication was supported by Grants # U17/CCU119390 and #U17/CCU119400 from the Centers for Disease Control and Prevention. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention.

Table of Contents

INTRODUCTION

Injuries are a serious and preventable public health problem. In Massachusetts, injuries are a leading cause of death and disability among all age groups. Injury rates may vary geographically due to a number of factors such as population density, age, and education. Maps of injury deaths and hospitalizations illustrate the variations in injury rates within geographic regions of Massachusetts and provide useful information for targeting injury prevention initiatives.

The Injury Atlas provides regional data on injury deaths in Massachusetts for the years 1992-2001 and injury hospitalizations in Massachusetts for the fiscal years 1998-2002. Injury rates are mapped by Community Health Network Area (CHNA) of residence. Established in 1992, a CHNA is a coalition of members from public, non-profit, and private sectors working to improve public health within their community. The 351 cities and towns in Massachusetts are grouped geographically into 27 CHNAs. The CHNA regions range in size from a few towns in the Boston area to entire counties in western Massachusetts. The CHNA is used as the geographic region of interest because the number of injuries for many of the 351 individual cities and towns are not of sufficient statistical size to present individually. Mapping by CHNA rather than county is more useful because CHNAs are already established to address public health concerns and implement prevention strategies.

Injury rates are mapped by injury intents, injury causes, and traumatic brain injury. Injury intent describes the manner in which the injury occurred and includes unintentional injury events or “accidents”, homicides and assaults, suicides and self-inflicted injuries, and injuries of undetermined intent. Injury cause describes the mechanism which resulted in injury, and while there are many causes of injury, the Injury Atlas focuses on the five leading causes of injury death in Massachusetts for 1992-2001: falls, poisonings, motor vehicle traffic, firearms, and suffocations. Traumatic brain injury (TBI) is an injury diagnosis that may result from many different causes and intents.

Average annual crude and age-adjusted injury rates are mapped by CHNA in relation to the Massachusetts average annual rate. Massachusetts age-adjusted rates are compared to the United States average.[1] Where applicable, the Healthy People 2010 benchmarks, which were established to promote public health, are also included for comparison.[2] In general, injury rates in Massachusetts compare favorably to the rest of the country, but the maps highlight areas where continued efforts are needed.

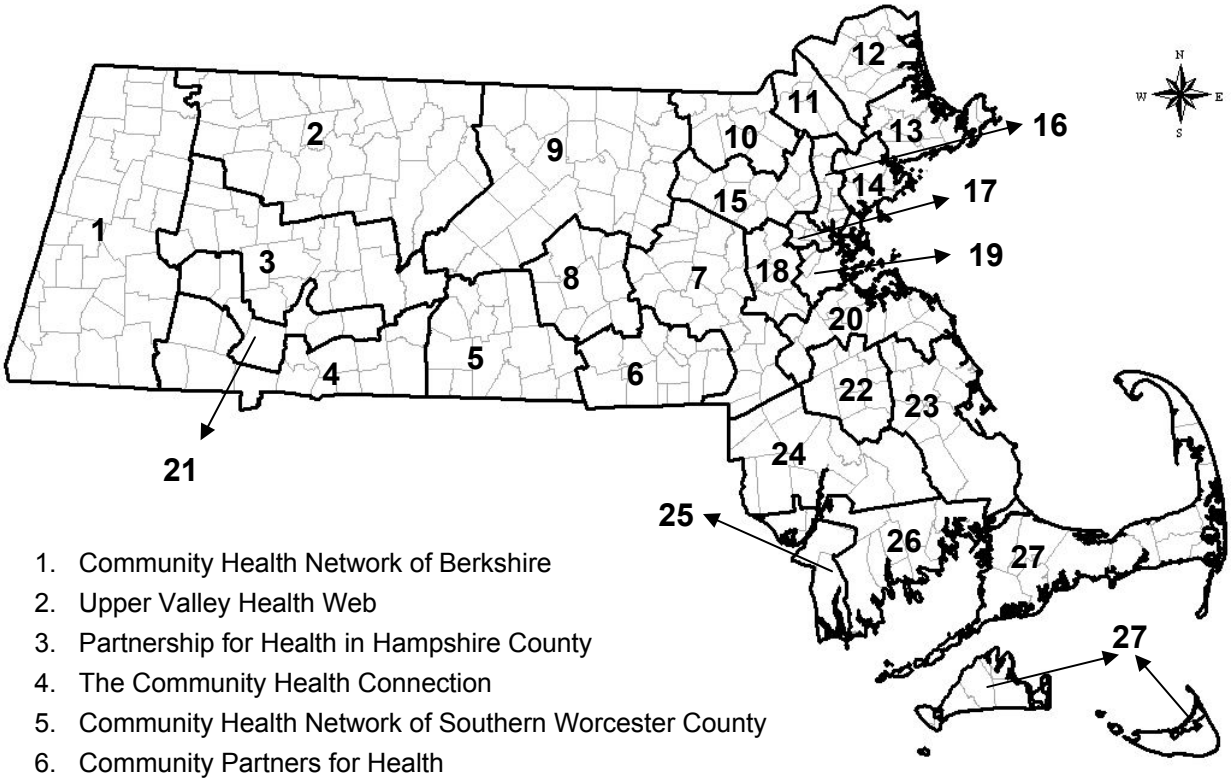
[1] U.S. rates were obtained from CDC Web-based Injury Statistics Query and Reporting System (WISQARS).
[2] Healthy People 2010, http://www.healthypeople.gov/Document/HTML/Volume2/15Injury.htm.

Geographical differences in population demographics may influence injury rates. Age, education, poverty level, population density, and the inability to read and understand instruction in English are known contributors to a person's risk of injury.[1-4] In addition to injury rate maps, the Atlas also includes maps of these demographic factors by CHNA to assist the user in interpreting geographical variation in injury rates. It should be noted that extensive demographic data for each CHNA is available via MassCHIP[5], an internet-accessible public health data source.

The Injury Atlas is a powerful tool intended to provide injury prevention practitioners and community groups with a better understanding of how injury rates vary across Massachusetts and assist them in program planning activities of most concern in their geographic area. Most fatal and nonfatal injuries are preventable. Injuries generally follow a predictable sequence of events, and interventions aimed at reducing or eliminating injuries can be implemented at multiple points in this sequence. Strategies aimed at reducing injuries are often referred to as the "3E"s of prevention: education, enactment and enforcement of laws, and environmental modification and engineering. Using these widely accepted strategies and the Injury Atlas as a geographic reference, injury prevention practitioners will continue to work towards reducing the number of preventable injuries to Massachusetts residents.

1. Lascala EA, Gerber D, Gruenewald PJ. 2000. Demographic and environmental correlates of pedestrian injury collisions: a spatial analysis. *Accid Anal Prev.* 32(5):651-8.
2. Whitlock G, Norton R, Clark T, Pledger M, Jackson R, MacMahon S. 2003. Motor vehicle driver injury and socioeconomic status: a cohort study with prospective and retrospective driver injuries. *J Epidemiol Community Health* 57(7):512-6.
3. Steenland K, Halperin W, Hu S, Walker JT. 2003. Deaths due to injuries among employed adults: the effects of socioeconomic class. *Epidemiology* 14(1):74-9.
4. Fuller GF. 2000. Falls in the elderly. *Am Fam Physician* 61(7):2159-68, 2173-4.
5. Massachusetts Community Health Information Profile (MassCHIP): http://masschip.state.ma.us/.

Location of CHNAs in Massachusetts



1. Community Health Network of Berkshire
2. Upper Valley Health Web
3. Partnership for Health in Hampshire County
4. The Community Health Connection
5. Community Health Network of Southern Worcester County
6. Community Partners for Health
7. Community Health Network of Greater Metro West
8. Common Pathways
9. Community Health Network of Central Massachusetts
10. Greater Lowell Community Health Network
11. Greater Lawrence Community Health Network
12. Greater Haverhill Community Health Network
13. Greater Beverly/Gloucester Community Health Network
14. North Shore Community Health Network
15. Northwest Suburban Health Alliance
16. North Suburban Health Alliance
17. Greater Cambridge/Somerville Community Health Network
18. West Suburban Health Network
19. Alliance for Community Health
20. Blue Hills Community Health Alliance
21. Community Health Network of Chicopee-Holyoke-Ludlow-Westfield**
22. Greater Brockton Community Health Network
23. South Shore Community Health Network
24. Greater Attleboro-Taunton Health Education
25. Partners for Healthier Communities
26. Greater New Bedford Community Health Network
27. Cape Cod and Islands Community Health Network

**Because Montgomery (CHNA 4) shares a zip code with Westfield (CHNA 21), Montgomery was included in CHNA 21 for the purposes of this report.

Massachusetts Towns by CHNA Number

CHNA 1
ADAMS
ALFORD
BECKET
CHESHIRE
CLARKSBURG
DALTON
EGREMONT
FLORIDA
GREAT BARRINGTON
HANCOCK
HINSDALE
LANESBOROUGH
LEE
LENOX
MONTEREY
MOUNT WASHINGTON
NEW ASHFORD
NEW MARLBOROUGH
NORTH ADAMS
OTIS
PERU
PITTSFIELD
RICHMOND
SANDISFIELD
SAVOY
SHEFFIELD
STOCKBRIDGE
TYRINGHAM
WASHINGTON
WEST STOCKBRIDGE
WILLIAMSTOWN
WINDSOR

CHNA 2
ASHFIELD
ATHOL
BERNARDSTON
BUCKLAND
CHARLEMONT
COLRAIN
CONWAY
DEERFIELD
ERVING
GILL
GREENFIELD
HAWLEY
HEATH
LEVERETT
LEYDEN
MONROE
MONTAGUE
NEW SALEM
NORTHFIELD
ORANGE
PETERSHAM
PHILLIPSTON
ROWE
ROYALSTON
SHELBURNE

CHNA 2 (CONT.)
SHUTESBURY
SUNDERLAND
WARWICK
WENDELL
WHATELY

CHNA 3
AMHERST
BELCHERTOWN
CHESTERFIELD
CUMMINGTON
EASTHAMPTON
GOSHEN
GRANBY
HADLEY
HATFIELD
MIDDLEFIELD
NORTHHAMPTON
PELHAM
PLAINFIELD
SOUTH HADLEY
SOUTHAMPTON
WARE
WESTHAMPTON
WILLIAMSBURG
WORTHINGTON

CHNA 4
AGAWAM
BLANDFORD
EAST LONGMEADOW
GRANVILLE
HAMPDEN
LONGMEADOW
MONSON
PALMER
RUSSELL
SOUTHWICK
SPRINGFIELD
TOLLAND
WEST SPRINGFIELD
WILBRAHAM

CHNA 5
BRIMFIELD
BROOKFIELD
CHARLTON
DUDLEY
EAST BROOKFIELD
HOLLAND
NORTH BROOKFIELD
OXFORD
SOUTHBRIDGE
SPENCER
STURBRIDGE
WALES
WARREN
WEBSTER
WEST BROOKFIELD

CHNA 6
BELLINGHAM
BLACKSTONE
DOUGLAS
FRANKLIN
HOPEDALE
MEDWAY
MENDON
MILFORD
MILLVILLE
NORTHBRIDGE
SUTTON
UPTON
UXBRIDGE

CHNA 7
ASHLAND
FOXBOROUGH
FRAMINGHAM
HOLLISTON
HOPKINTON
HUDSON
MARLBOROUGH
MAYNARD
MEDFIELD
MILLIS
NATICK
NORFOLK
NORTHBOROUGH
PLAINVILLE
SHERBORN
SOUTHBOROUGH
STOW
SUDBURY
WALPOLE
WAYLAND
WESTBOROUGH
WRENTHAM

CHNA 8
AUBURN
BOYLSTON
GRAFTON
HOLDEN
LEICESTER
MILLBURY
PAXTON
SHREWSBURY
WEST BOYLSTON
WORCESTER

CHNA 9
ASHBURNHAM
ASHBY
AYER
BARRE
BERLIN
BOLTON

CHNA 9 (CONT.)
CLINTON
FITCHBURG
GARDNER
GROTON
HARDWICK
HARVARD
HUNNARDSTON
LANCASTER
LEOMINSTER
LUNENBURG
NEW BRAINTREE
OAKHAM
PEPPERELL
PRINCETON
RUTLAND
SHIRLEY
STERLING
TEMPLETON
TOWNSEND
WESTMINSTER
WINCHENDON

CHNA 10
BILLERICA
CHELMSFORD
DRACUT
DUNSTABLE
LOWELL
TEWKSBURY
TYNGSBOROUGH
WESTFORD

CHNA 11
ANDOVER
LAWRENCE
METHUEN
MIDDLETON
NORTH ANDOVER

CHNA 12
AMESBURY
BOXFORD
GEORGETOWN
GROVELAND
HAVERHILL
MERRIMAX
NEWBURY
NEWBURYPORT
ROWLEY
SALISBURY
WEST NEWBURY

CHNA 13
BEVERLY
ESSEX
GLOUCESTER
HAMILTON
IPSWICH
MANCHESTER
ROCKPORT
TOPSFIELD
WENHAM

CHNA 14
DANVERS
LYNN
LYNNFIELD
MARBLEHEAD
NAHANT
PEABODY
SALEM
SAUGUS
SWAMPSCOTT

CHNA 15
ACTON
BEDFORD
BOXBOROUGH
BURLINGTON
CARLISLE
CONCORD
LEXINGTON
LINCOLN
LITTLETON
WILMINGTON
WINCHESTER
WOBURN

CHNA 16
EVERETT
MALDEN
MEDFORD
MELROSE
NORTH READING
READING
STONEHAM
WAKEFIELD

CHNA 17
ARLINGTON
BELMONT
CAMBRIDGE
SOMERVILLE
WATERTOWN

CHNA 18
DEDHAM
DOVER
NEEDHAM
NEWTON
WALTHAM
WELLESLEY
WESTON
WESTWOOD

CHNA 19
BOSTON
BROOKLINE
CHELSEA
REVERE
WINTHROP

CHNA 20
BRAINTREE
CANTON
COHASSET
HINGHAM
HULL
MILTON
NORWELL
NORWOOD
QUINCY
RANDOLPH
SCITUATE
SHARON
WEYMOUTH

CHNA 21
CHESTER
CHICOPEE
HOLYOKE
HUNTINGTON
LUDLOW
MONTGOMERY**
WESTFIELD

CHNA 22
ABINGTON
AVON
BRIDGEWATER
BROCKTON
EAST BRIDGEWATER
EASTON
HOLBROOK
STOUGHTON
WEST BRIDGEWATER
WHITMAN

CHNA 23
CARVER
DUXBURY
HALIFAX
HANOVER
HANSON
KINGSTON
MARSHFIELD
PEMBROKE
PLYMOUTH
PLYMPTON
ROCKLAND

CHNA 24
ATTLEBORO
BERKLEY
DIGHTON
LAKEVILLE
MANSFIELD
MIDDLEBOROUGH
NORTH ATTLEBOROUGH
NORTON
RAYNHAM
REHOBOTH
SEEKONK
TAUNTON

CHNA 25
FALL RIVER
SOMERSET
SWANSEA
WESTPORT

CHNA 26
ACUSHNET
DARTMOUTH
FAIRHAVEN
FREETOWN
MARION
MATTAPOISETT
NEW BEDFORD
ROCHESTER
WAREHAM

CHNA 27
AQUINNAH
BARNSTABLE
BOURNE
BREWSTER
CHATHAM
CHILMARK
DENNIS
EASTHAM
EDGARTOWN
FALMOUTH
GOSNOLD
HARWICH
MASHPEE
MANTUCKET
OAK BLUFFS
ORLEANS
PROVINCETOWN
SANDWICH
TISBURY
TRURO
WELLFLEET
WEST TISBURY
WARMOUTH

**Because Montgomery (CHNA 4) shares a zip code with Westfield (CHNA 21), Montgomery was included in CHNA 21 for the purposes of this report.

METHODS

Objectives

The Injury Atlas provides geographic patterns of injury rates throughout Massachusetts. The purpose of the atlas is to identify geographical areas where residents have injury death and hospitalization rates that are elevated in relation to the Massachusetts average. Injury hospitalization rates are calculated using the five most recent years of available data (FY1998-2002). Rates for injury deaths are based on data aggregated over ten years (1992-2001) so that numbers are large enough to generate stable rates.

Data Sources

Injury Deaths

Injury death data are obtained from the Registry of Vital Records and Statistics. Records include city/town codes, which are directly aggregated into CHNAs. For data from 1992 to 1998, an injury death is defined as any death with an International Classification of Disease 9th revision (ICD-9) code ranging from 800-999 in the underlying cause field. In 1999, death certificates were coded for the first time using International Classification of Disease 10th revision (ICD-10). An injury death is defined as any death with an ICD-10 code of V01-Y36, Y85-Y87, or Y89 in the underlying cause field. The *Matrix of E-code Groupings for Presenting Injury Mortality and Morbidity Data*[1], developed by the Centers for Disease Control and Prevention, was used to group injury categories. Injury deaths due to surgical and medical complications and adverse effects of therapeutic drugs are excluded from these analyses. The grouping of ICD-9 and ICD-10 external causes of injury codes used in this report can be found in Appendix H. Because the September 11, 2001 attacks are an isolated terror-related incident, the deaths of the 87 Massachusetts residents who lost their lives in the attacks are also excluded (ICD-10 codes of U01-U04).

Despite the coding change from ICD-9 to ICD-10, injury numbers are aggregated over the ten year time period for the purposes of the Atlas. Comparability between ICD-9 and ICD-10 is relatively high overall for injury deaths.[2] Slight differences should not influence the geographical variation of injury rates among CHNAs because the change was applied across the state.

[1] Recommended framework for presenting injury mortality data. MMWR Recomm Rep. 1997 Aug 29;46(RR-14):1-30.

[2] Anderson RN, Minino AM, Hoyert DL, Rosenberg HM. 2001. Comparability of cause of death between ICD-9 and ICD-10: preliminary estimates. Natl Vital Stat Rep. May 18;49(2):1-32.

Injury Hospitalizations

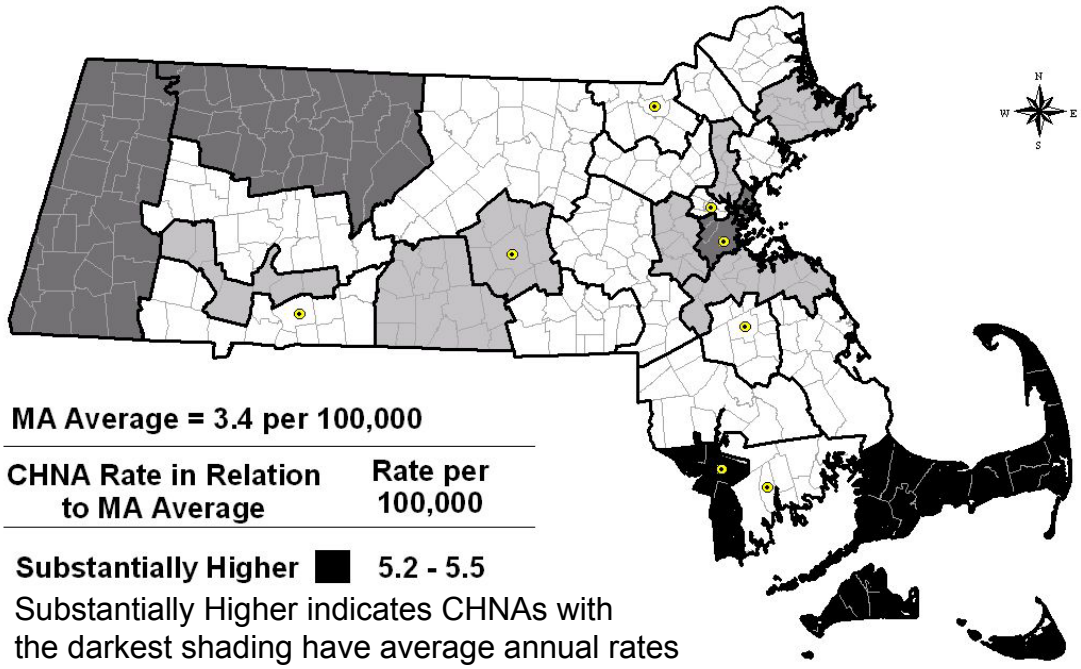
The source of hospitalization data is the Massachusetts Hospital Discharge Database administered by the Massachusetts Division of Health Care Finance and Policy. Hospital discharge data are based on a fiscal year (October 1 – September 30). For the purposes of this report, an injury hospitalization is defined as any case having an International Classification of Disease 9th revision Clinical Modification (ICD9-CM) Nature of Injury Code of 800-999 assigned to any of the diagnosis fields. The primary External Cause of Injury Code (E Code) field is used to categorize the intent and cause of the injury. Hospitalizations due to certain adverse effects, such as complications of medical or surgical care (995.0-995.4, 995.6, 995.7, 995.86, 995.89, and 996-999), and certain late effects of injuries (909.3, 909.5) are excluded if no other valid ICD9-CM code is assigned to one of the diagnosis fields. The *Matrix of E-code Groupings for Presenting Injury Mortality and Morbidity Data* was used to group injury categories. Persons who died while in the hospital or those transferred to another acute care facility are excluded from hospital analyses. Hospital records include zip-code-level information, which is linked to corresponding towns and aggregated by CHNA. Only records with valid Massachusetts zip codes are included in the calculations.

Statistical Measures

Average annual crude and age-adjusted injury rates are mapped by CHNA in relation to the Massachusetts average annual rate. Crude rates provide the true rate of injury within a population. To calculate average annual crude rates, the number of injuries for a given time period are averaged, and divided by 2000 population data from the US Census Bureau. Population data from 2000 is used to calculate injury hospitalization rates because it is the midyear of the hospital data. For consistency, the same population data was used to calculate injury death rates as well. Average annual age-adjusted maps control for different age distributions among CHNAs. To calculate average annual age-adjusted rates, injury rates by age group are weighted using the 2000 US population standard, which allows Massachusetts rates to be compared to national rates. Injury rates are expressed as the number of deaths or hospitalizations per 100,000 population. This document does not report statistical significance testing because statistically insignificant differences in rates still may be important. A map of CHNA population size is included for the reader to understand the variation in CHNA populations used in the generation of injury rates.

Map Layout

In the maps' legend, the highest rates are indicated by the darkest color. The CHNAs are outlined by a thick black line and cities/towns are outlined by a thin grey line. An example map describes the legend used.



MA Average = 3.4 per 100,000

CHNA Rate in Relation to MA Average	Rate per 100,000
Substantially Higher	**5.2 - 5.5**

Substantially Higher indicates CHNAs with the darkest shading have average annual rates of injury that are greater than 1.5 times the state average. In this example, the state average is 3.4 per 100,000, so CHNAs in the darkest shading have rates greater than 5.1 (1.5 times 3.4). The highest rate in this example is 5.5 per 100,000. Had there been no CHNA with a rate greater than 1.5 times the state average, then there would be no CHNA with the darkest shading present and the rate range would have been written as > 5.1.

Moderately Higher **4.4 - 5.1**

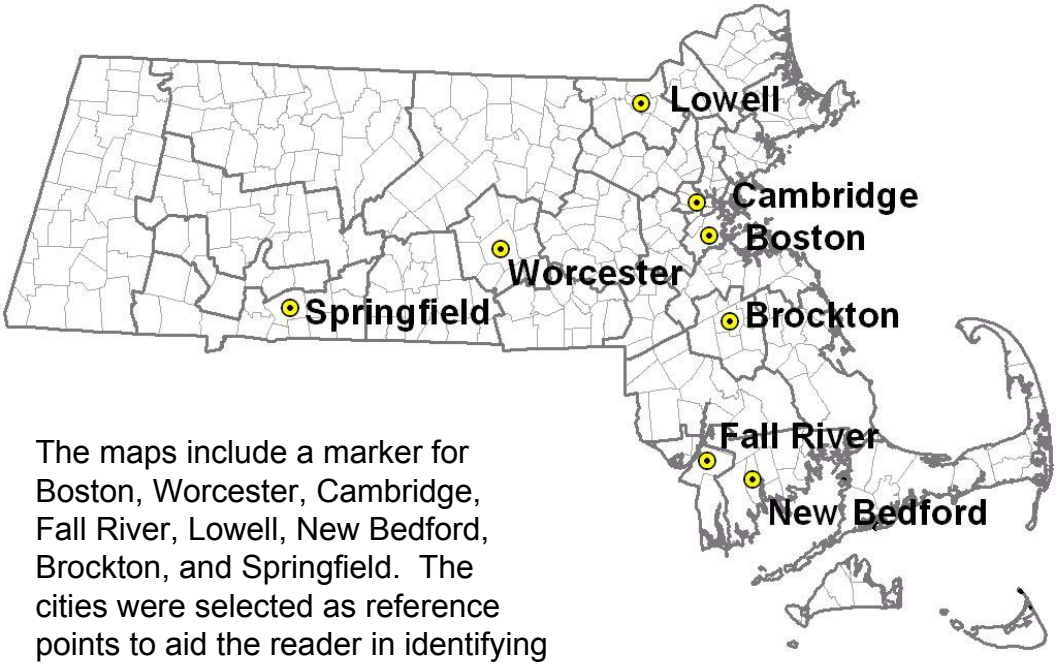
Moderately Higher indicates CHNAs with medium shading have rates that range from greater than 1.25 times to 1.5 times the state average, or 4.4 and 5.1 per 100,000 (1.25 times 3.4, and 1.5 times 3.4).

Slightly Higher **3.5 - 4.3**

Slightly Higher indicates CHNAs with light shading have rates that range from greater than the state average to 1.25 times the state average, or 3.5 and 4.3 per 100,000.

At or Below **2.0 - 3.4**

At or Below indicates those CHNAs with no shading have rates that are equal to or less than the state average (3.4 per 100,000) with the lower bound being the minimum rate (2.0 per 100,000 in this example).



The maps include a marker for Boston, Worcester, Cambridge, Fall River, Lowell, New Bedford, Brockton, and Springfield. The cities were selected as reference points to aid the reader in identifying CHNAs that are discussed in the Atlas. The source of geographical data is the Massachusetts Executive Office of Environmental Affairs, MassGIS.

Bar graphs below each map show the Massachusetts average annual rate and the average annual injury rates for each CHNA. A line is also included in the graph for the Healthy People 2010 benchmark if one applies to that particular injury. The Healthy People 2010 Initiative is a statement of U.S. health objectives designed to identify the most important preventable threats to health. It includes a set of guidelines for injury rates to be met by 2010 in an effort to promote injury prevention. The maps help identify CHNAs that may need added efforts in injury prevention to reach these objectives.

LIMITATIONS

An important limitation of the Injury Atlas is that injury rates are calculated by CHNA rather than by city/town. This results in an averaging effect among the cities/towns in any one CHNA. Therefore, a particular city/town rate may be much higher or lower than the overall CHNA rate in which that city/town is located. Although mapping by a city/town would provide more specific information, the numbers would often not be of sufficient size for the calculation of stable rates.

Because data is aggregated over years, a CHNA rate may also be influenced by data from outlier years. For example, suicide rates for the Upper Valley Health Web (CHNA 2, the Franklin County area; Figure 17 and 18) are substantially higher than the state average because in 1992 there were 21 suicides while in 1993-2001 there were an average of 9 suicides per year. Furthermore, death and hospitalization data are aggregated over different time periods so maps of deaths rates (aggregated over ten years) and hospitalization rates (aggregated over five years) should be compared cautiously.

Despite aggregating data over several years and using larger geographic mapping units, the number of injuries in a specific area may be small. Homicide rates (Figures 21 and 22) for some CHNAs are based on numbers fewer than 20 and are considered unstable. Therefore, these maps should be interpreted carefully. Appendix D and E provide tables of the numbers and rates for each injury by CHNA.

Another limitation is that injury death and hospitalization data used in the Injury Atlas reflect the location where the person lived and not necessarily where the injury occurred. For example, maps of motor vehicle traffic injuries do not illustrate locations where motor vehicle traffic events are more likely to occur; they illustrate where people who are involved in these events live. This should be kept in mind when interpreting geographical variations in injury rates and in planning interventions. Due to this limitation, the Injury Atlas does not include geographic features such as proximity to high-volume traffic intersections or hospitals so as to not mislead the reader. Continued efforts are being made to improve data on the location of injury in the state.

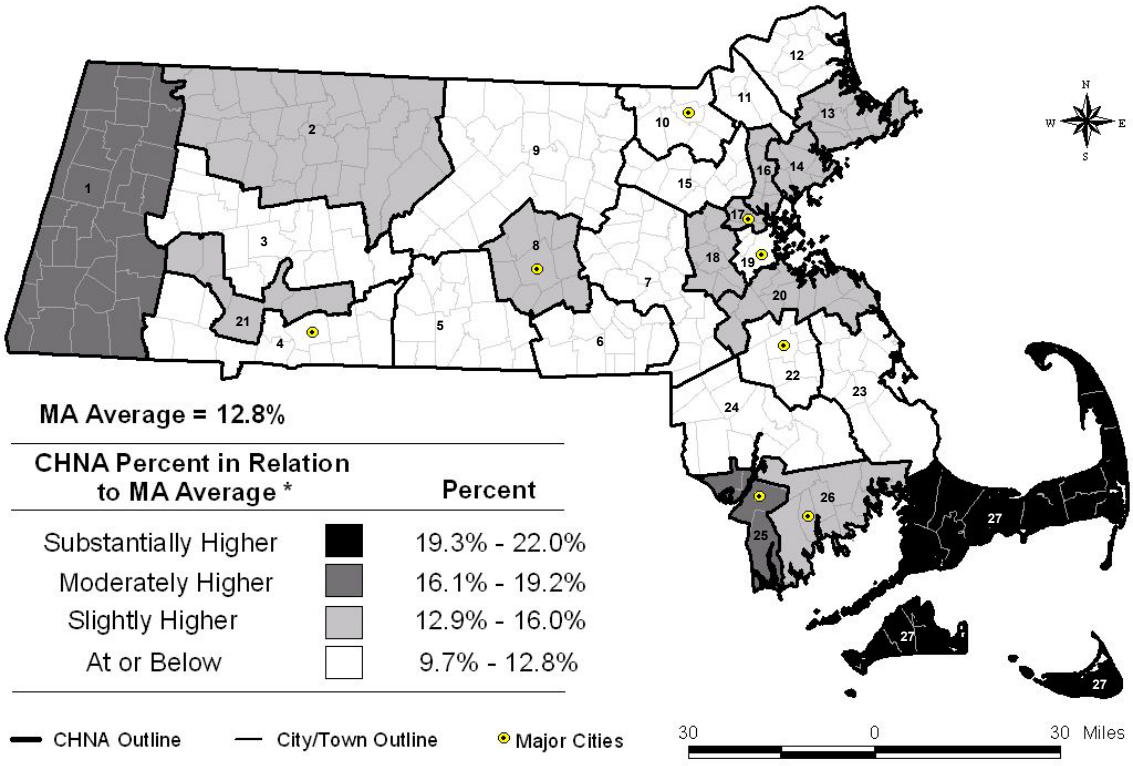
It should also be noted that the Massachusetts Hospital Discharge Database contains only the patients' zip codes of residence and not the city/town of residence. Some zip codes are shared by multiple cities/towns, but in only one instance does the zip code cross a CHNA boundary. Zip code 01085 is shared by both Montgomery (CHNA 4) and Westfield (CHNA 21). For the purposes of this Atlas, Montgomery is grouped with CHNA 21.

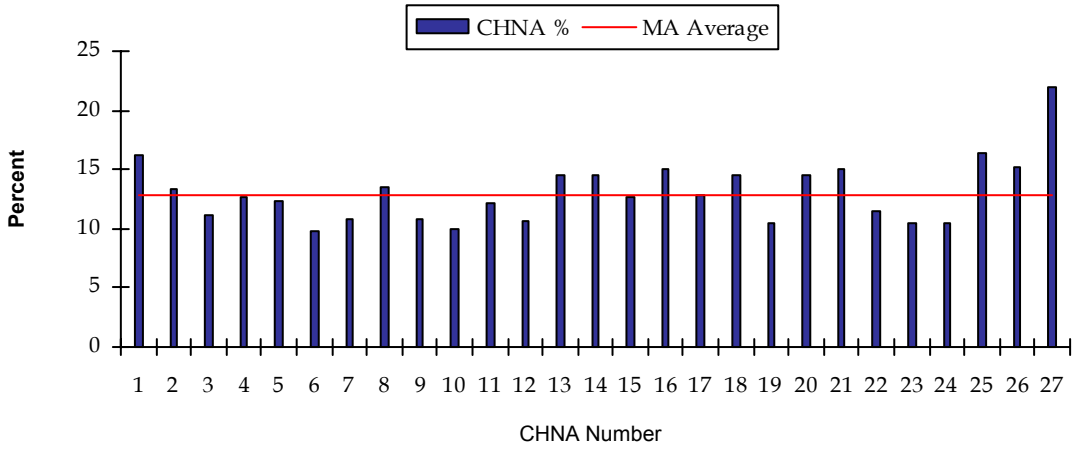
There are also limitations inherent in the injury data itself. In 1999, death certificates were coded for the first time using the International Classification of Diseases, Tenth Revision (ICD-10). While comparability between ICD-9 and ICD-10 is relatively high overall for injury deaths, comparability for specific injury causes may differ slightly. For the purposes of this Atlas, injury death rates are based on the numbers of injury deaths summed over the ten year period from 1992 to 2001.

Lastly, some suicide and self-inflicted injuries may be classified as "undetermined intent" or "unintentional" if there is inadequate information regarding the intent of the injury. Thus, incomplete circumstantial evidence, as well as social stigma surrounding self-injury, may lead to an under-reporting of the number of suicides and non-fatal self-inflicted injuries. Likewise, many fatal drug overdoses of illicit substances (poisonings) in Massachusetts are classified as "undetermined intent." This differs from other states wherein most of these deaths are classified as "unintentional." Therefore, any cross-state and national comparisons of Massachusetts unintentional injury death rates should take into consideration these differing classification methods.

Section I: Demographics of Massachusetts Residents, 2000

Figure 1. Percent of Population 65 Years and Older by CHNA of Residence, 2000

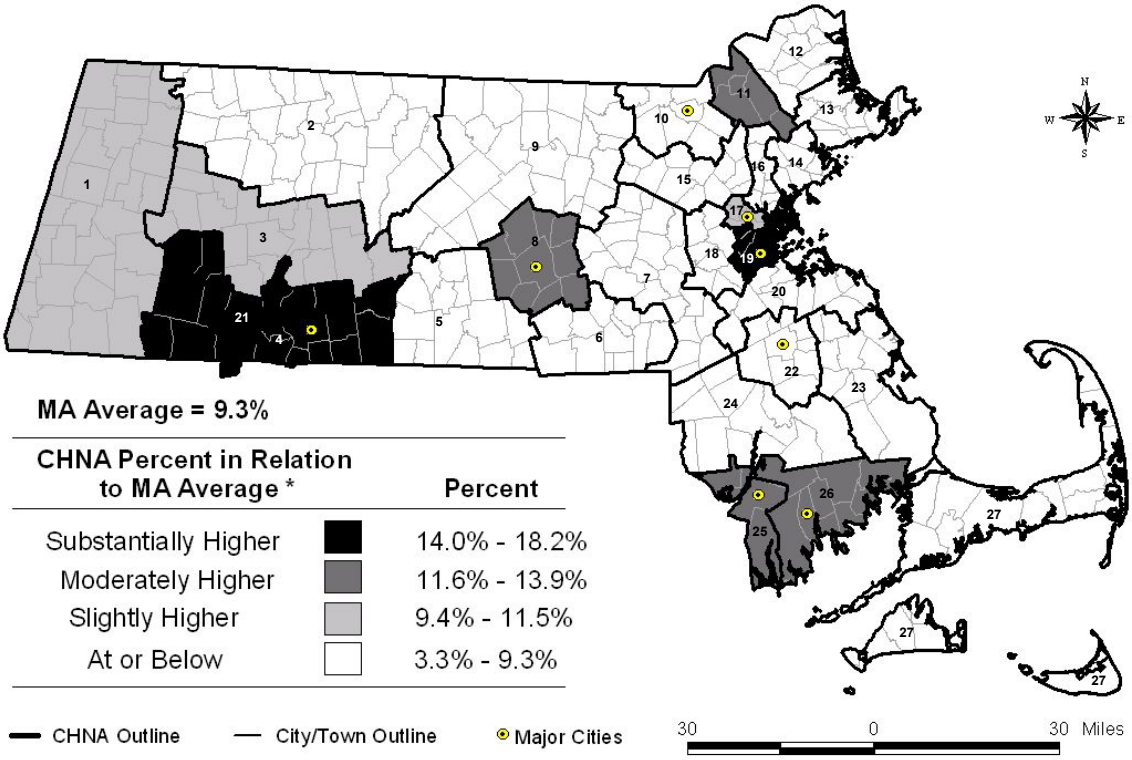


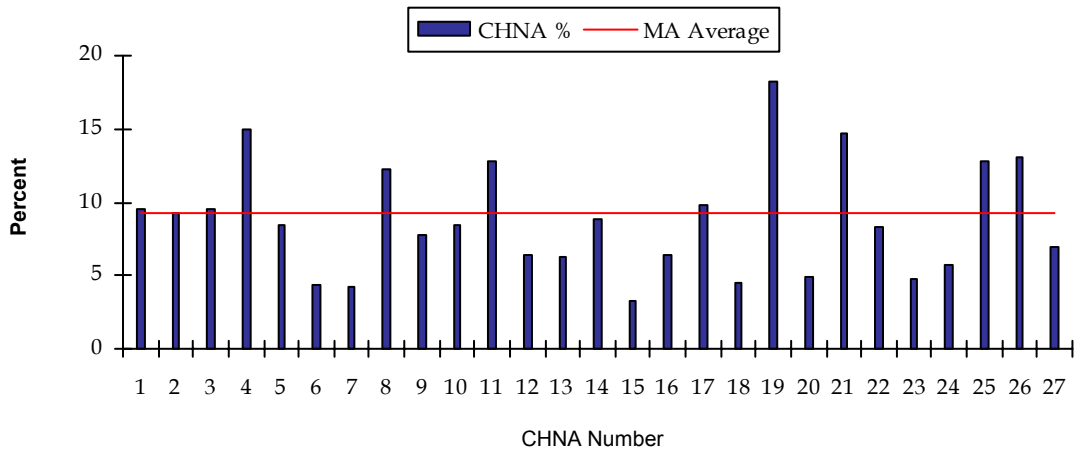


Data Sources: Census 2000, 1990 Socio-Demographic Trends, Massachusetts Community Health Information Profile (MassCHIP) Instant Topics, Massachusetts Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 2. Percent of Population Below Poverty Level** by CHNA of Residence, 2000



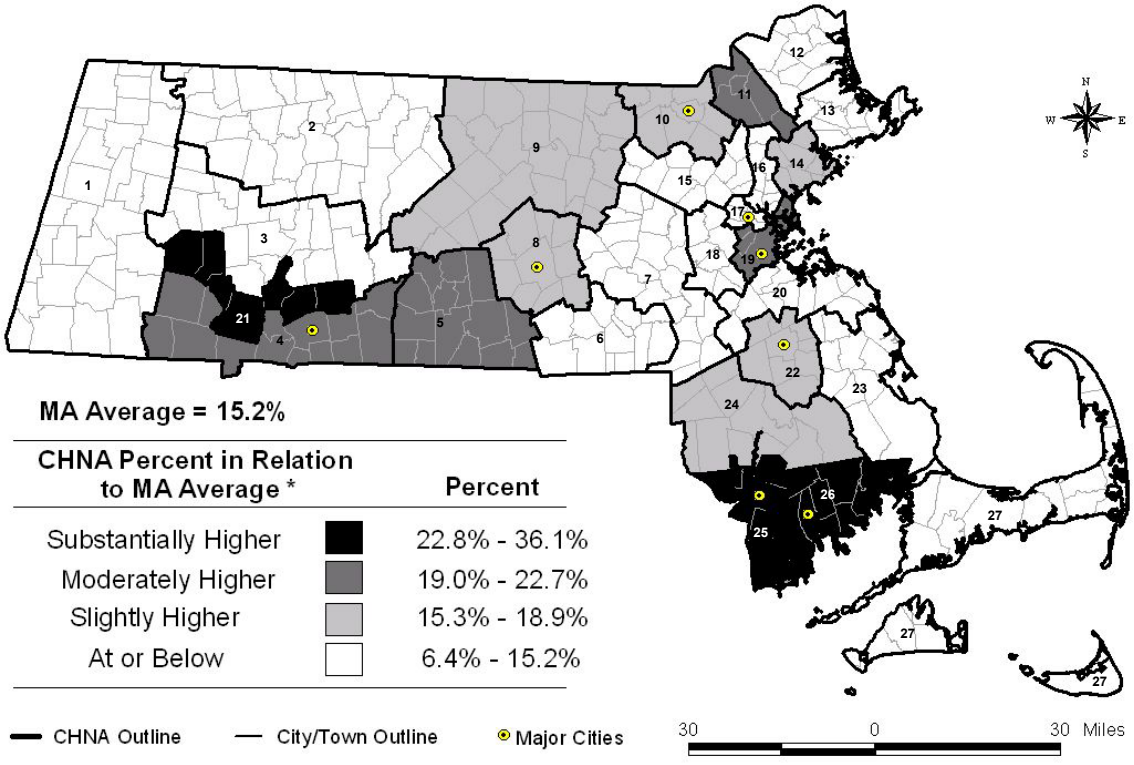


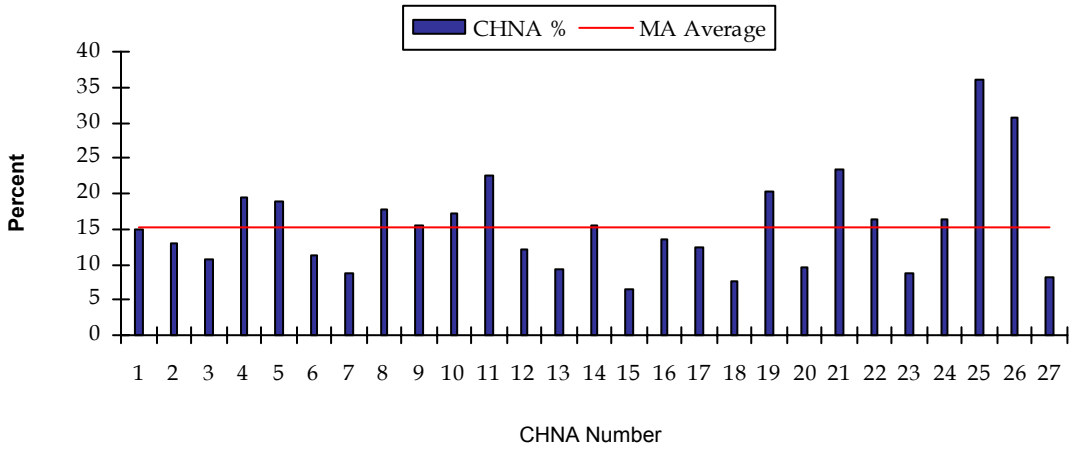
Data Sources: Census 2000, 1990 Socio-Demographic Trends, Massachusetts Community Health Information Profile (MassCHIP) Instant Topics, Massachusetts Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

** Poverty level is based on size of the family and number of related children under 18 years.

Figure 3. Percent of Population with Education Less Than High School Graduation by CHNA of Residence, 2000

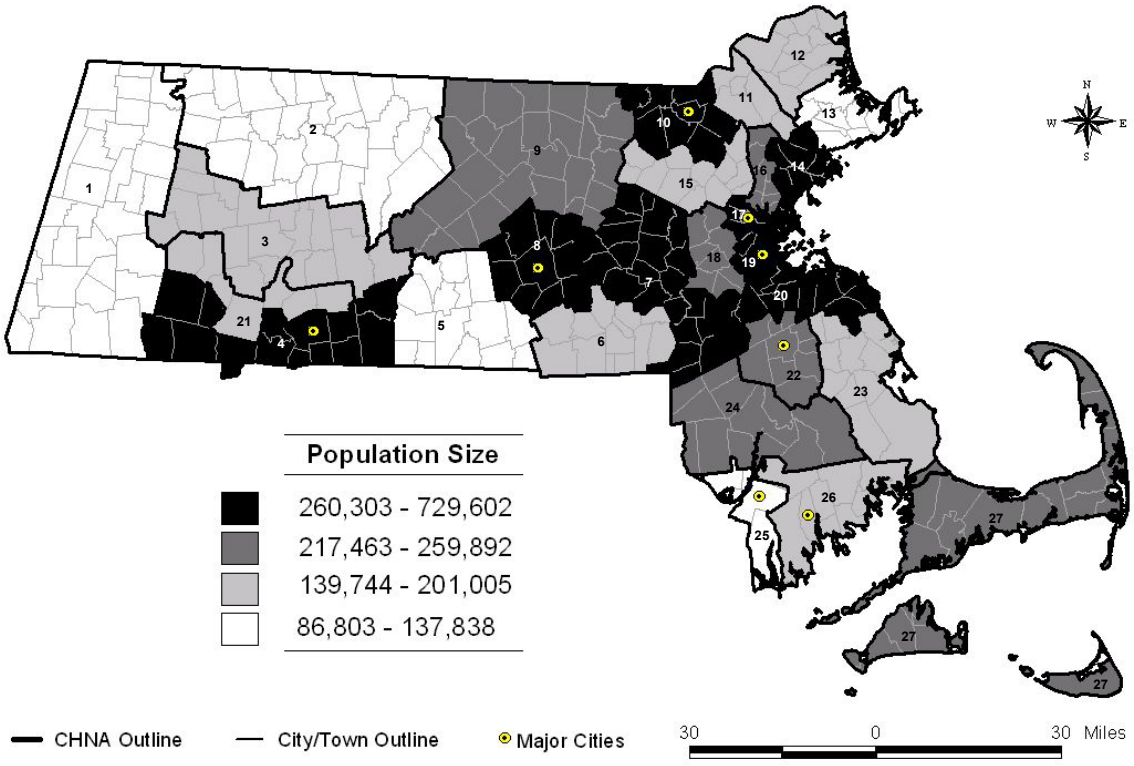


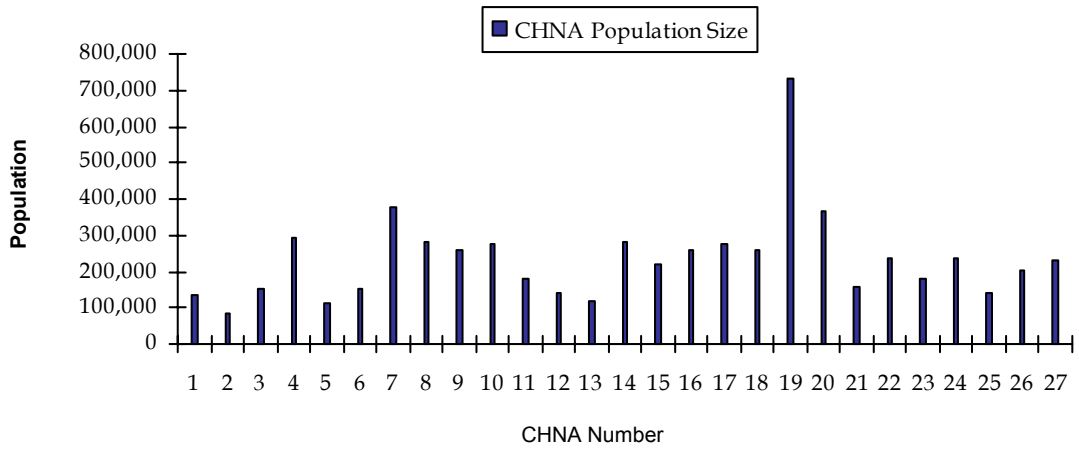


Data Sources: Census 2000, 1990 Socio-Demographic Trends, Massachusetts Community Health Information Profile (MassCHIP) Instant Topics, Massachusetts Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

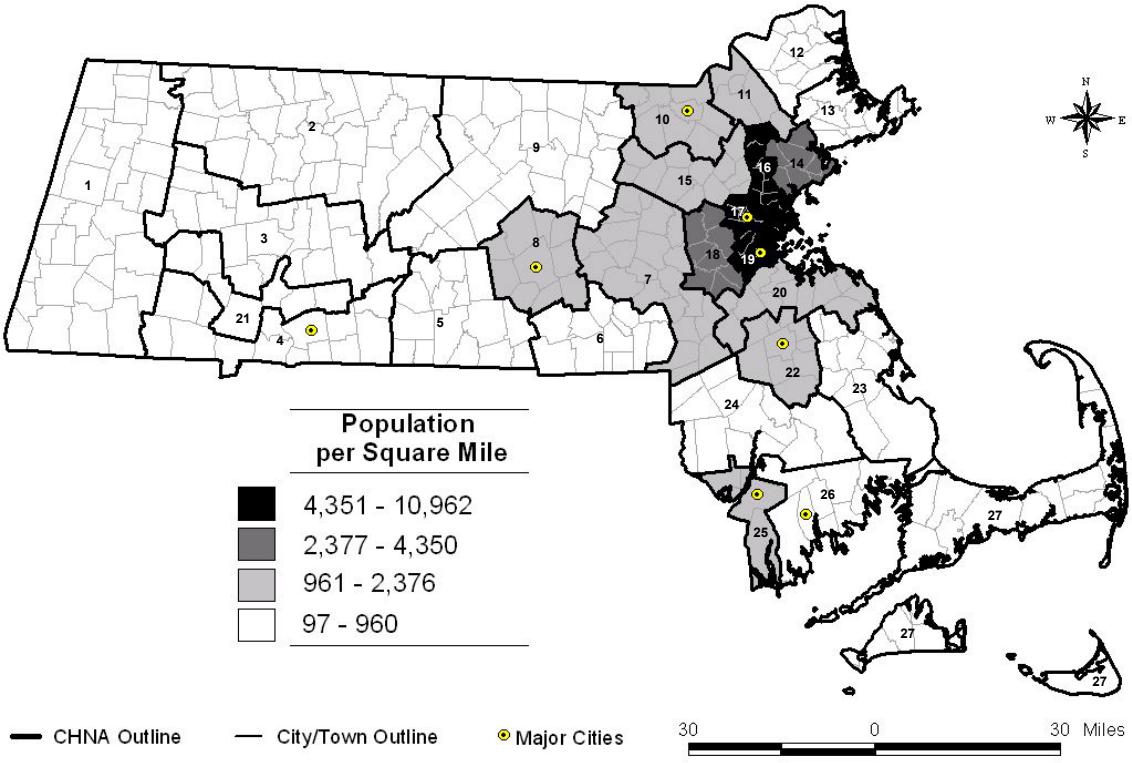
Figure 4. Population Size of CHNA, 2000

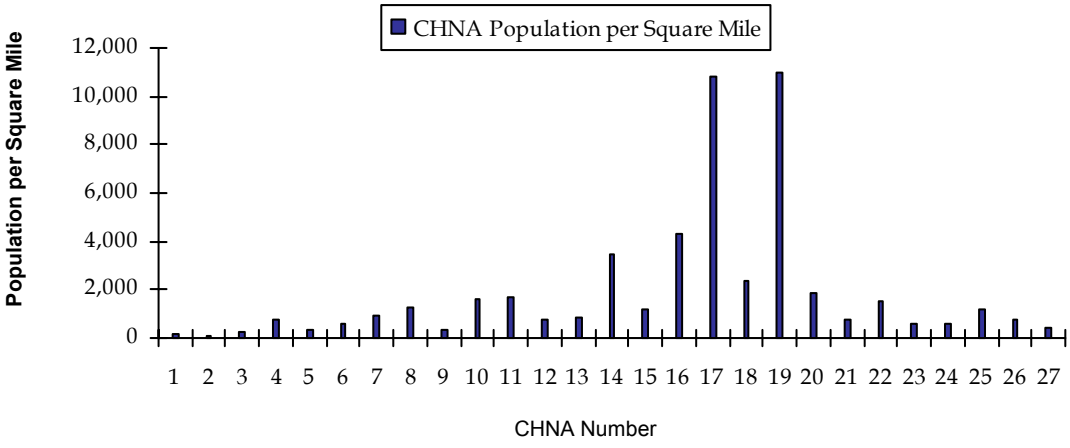




Data Sources: Census 2000, 1990 Socio-Demographic Trends, Massachusetts Community Health Information Profile (MassCHIP) Instant Topics, Massachusetts Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

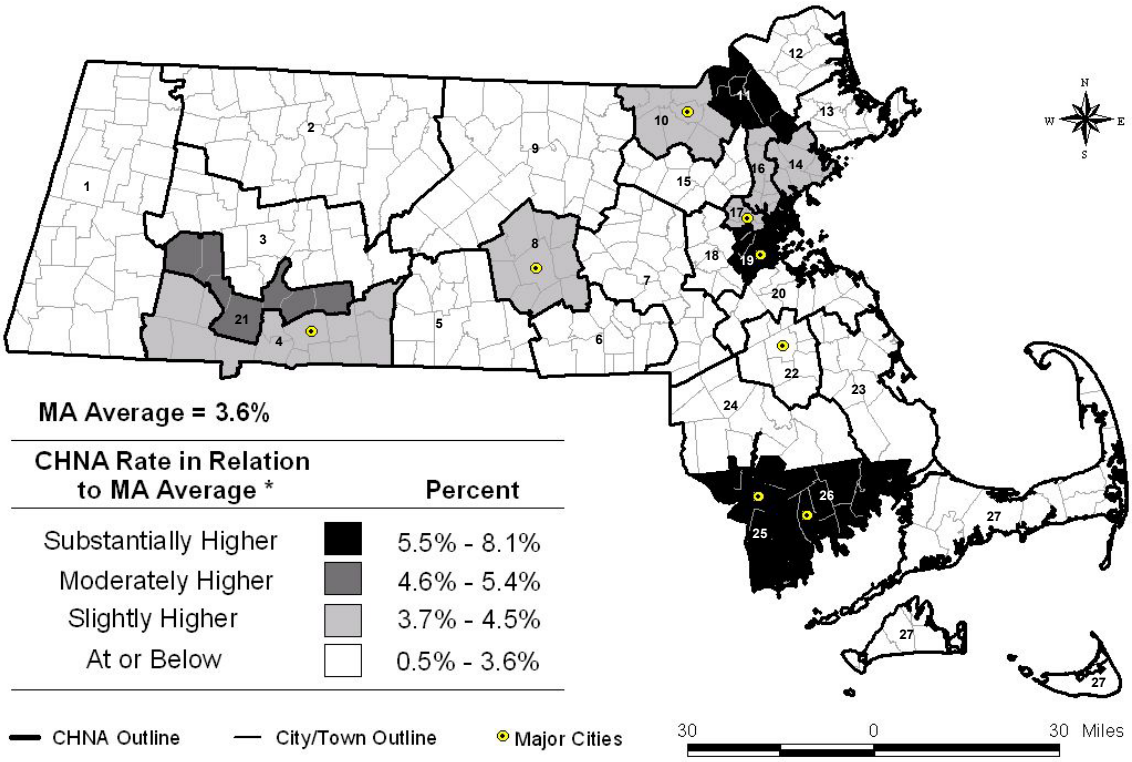
Figure 5. Population per Square Mile of CHNA, 2000

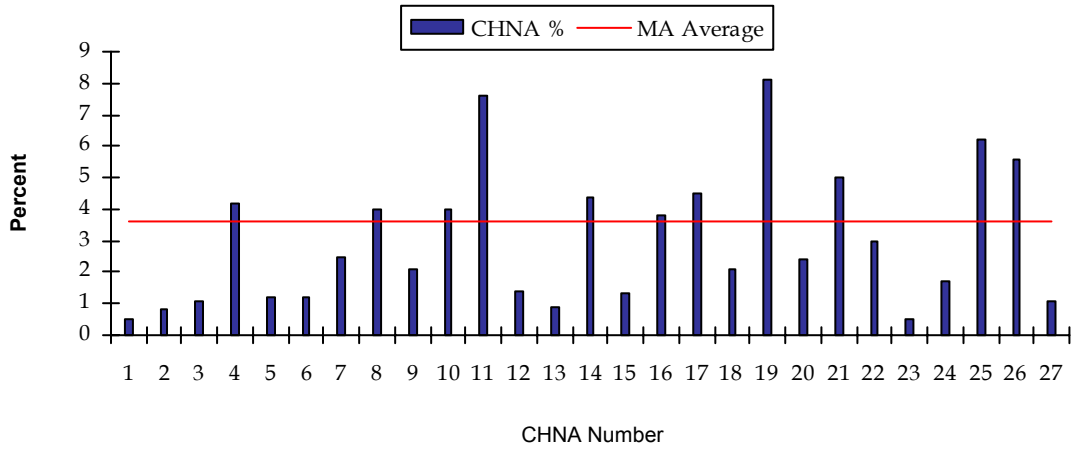




Data Sources: Census 2000, 1990 Socio-Demographic Trends, Massachusetts Community Health Information Profile (MassCHIP) Instant Topics, Massachusetts Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

Figure 6. Percent of Population that Do Not Speak English Well or Very Well by CHNA of Residence, 2000

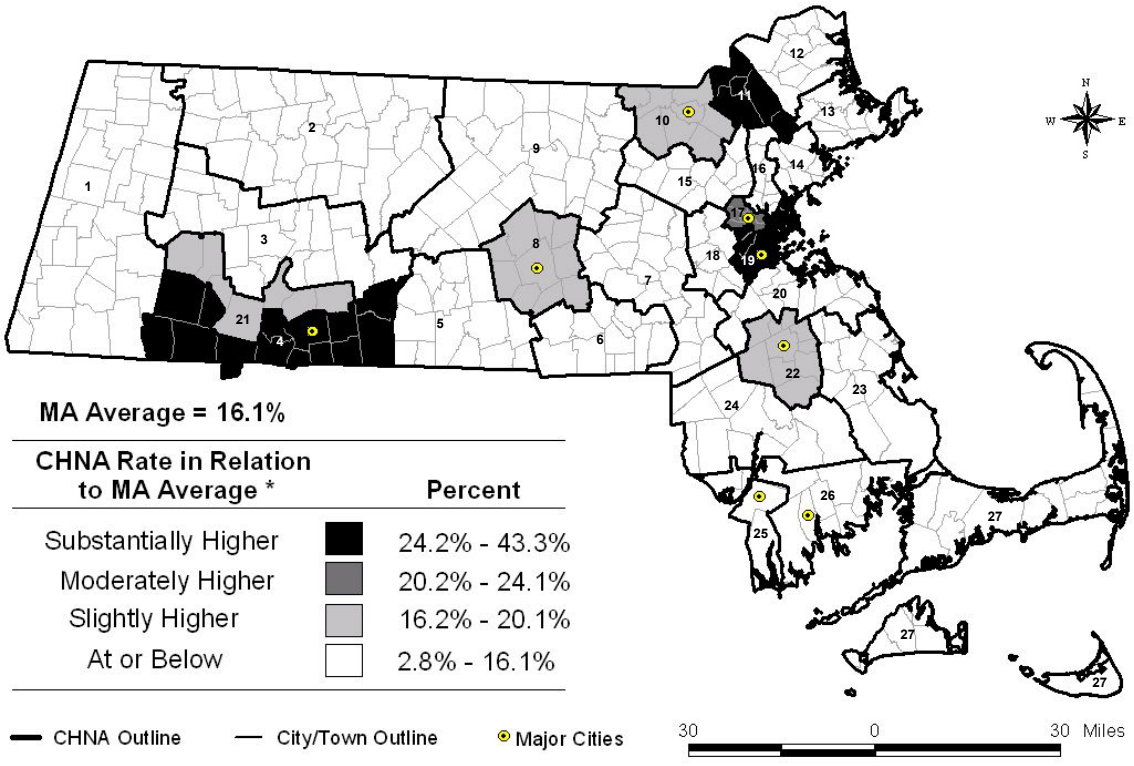


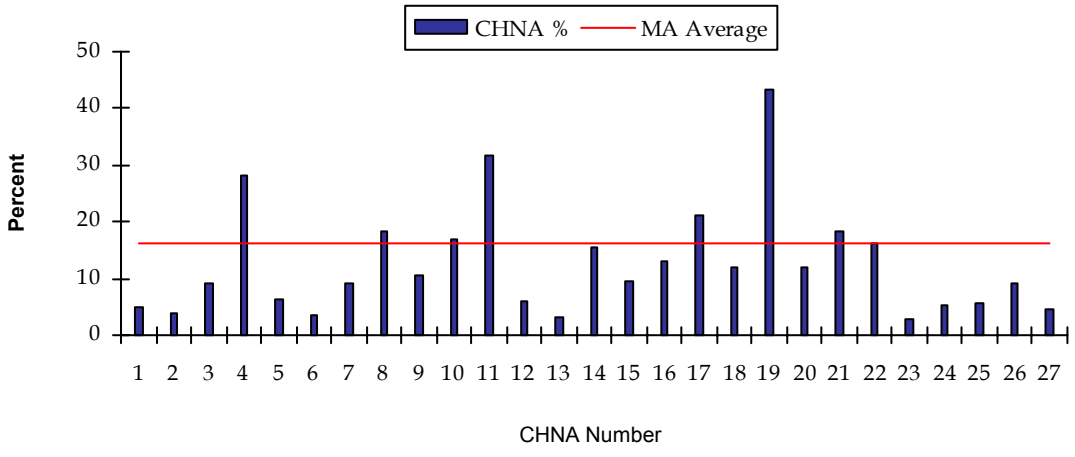


Data Sources: Census 2000, 1990 Socio-Demographic Trends, Massachusetts Community Health Information Profile (MassCHIP) Instant Topics, Massachusetts Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 7. Percent of Population of Non-White Race** by CHNA of Residence, 2000





Data Sources: Census 2000, 1990 Socio-Demographic Trends, Massachusetts Community Health Information Profile (MassCHIP) Instant Topics, Massachusetts Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

** Non-White Race includes Black Non-hispanic, Hispanic, Asian Pacific Islander, and Native American.

Section II: Average Annual Total Injury Rates

TOTAL INJURY

Deaths

In Massachusetts, from 1992 through 2001, there were 23,907 total injury deaths, for an average of 2,391 deaths per year and an average annual crude rate of 37.6 deaths per 100,000. The average annual age-adjusted rate in Massachusetts was 37.0 deaths per 100,000. In comparison, the U.S. average annual age-adjusted rate was 54.6 deaths per 100,000.

Hospitalizations

From 1998 through 2002, there were 248,275 total injury-related hospitalizations, for an average of 49,655 hospitalizations per year and an average annual crude rate of 780.7 hospitalizations per 100,000. The average annual age-adjusted rate in Massachusetts was 776.5 hospitalizations per 100,000.

Findings

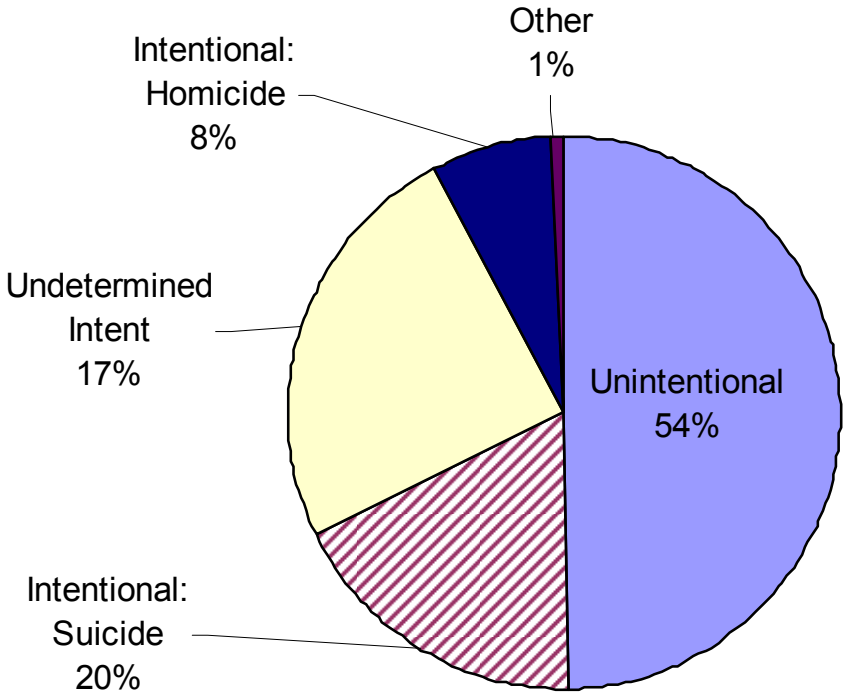
The highest crude injury death rates for all injuries combined were observed in the geographic areas of the Alliance for Community Health (CHNA 19, the Boston area), the Community Health Network of Chicopee-Holyoke-Ludlow-Westfield (CHNA 21), and the Partners for Healthier Communities (CHNA 25, the Fall River area), where rates were moderately higher than the Massachusetts average. After adjusting for age, the area of CHNA 19 remained moderately higher.

Moderately higher crude rates of total injury hospitalizations were observed in the geographic areas of the Community Health Network of Berkshire (CHNA 1) and the Cape Cod and Islands Community Health Network (CHNA 27). The age-adjusted map shows moderately higher hospitalization rates were observed in the areas of the Alliance for Community Health (CHNA 19, the Boston area) and the CHNA of Berkshire.

The elevated age-adjusted rates observed in the geographic area of CHNA 19 may be influenced by poverty (Figure 2), population density (Figure 5), and language comprehension (Figure 6), since these factors have been shown to contribute to elevated injury rates.[1-2]

1. Lascala EA, Gerber D, Gruenewald PJ. 2000. Demographic and environmental correlates of pedestrian injury collisions: a spatial analysis. *Accid Anal Prev.* 32(5):651-8.
2. Steenland K, Halperin W, Hu S, Walker JT. 2003. Deaths due to injuries among employed adults: the effects of socioeconomic class. *Epidemiology* 14(1):74-9.

Figure 8. Distribution of Total Injury Deaths by Intent, Massachusetts Residents, 1992-2001



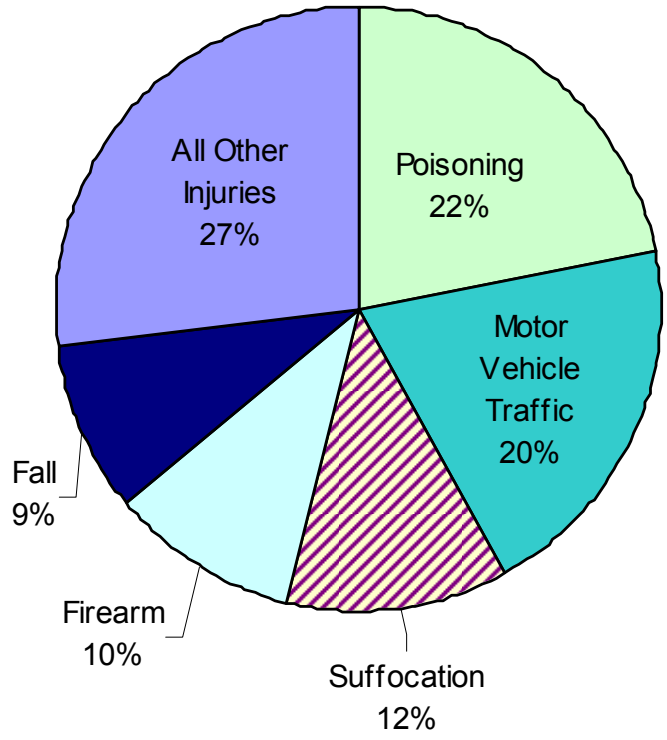
(N=23,907)

Data Source: Registry of Vital Records and Statistics, MA Department of Public Health.
"Other" intent includes legal intervention and operations of war.

For 1992-2001:

- Unintentional injuries accounted for 54% of all injury fatalities, while 28% were intentionally inflicted (homicide, 8%; suicide, 20%).
- Of the 12,871 unintentional injury deaths among Massachusetts residents during the period 1992-2001, 38% were motor vehicle traffic-related, 15% were due to falls, and 8% were suffocations.
- Of the 6,520 intentional injury deaths, 73% were suicides and 27% were homicides. Suicide was 2.6 times more frequent than homicide.
- During this period, 17% of all injury deaths were of undetermined intent. In those deaths, the medical examiner lacked sufficient evidence to classify the death as homicide, suicide, or accidental.
- Ninety-two percent of injury deaths of undetermined intent were due to poisonings, which includes drug overdoses.

Figure 9. Distribution of Total Injury Deaths by Cause, Massachusetts Residents, 1992-2001



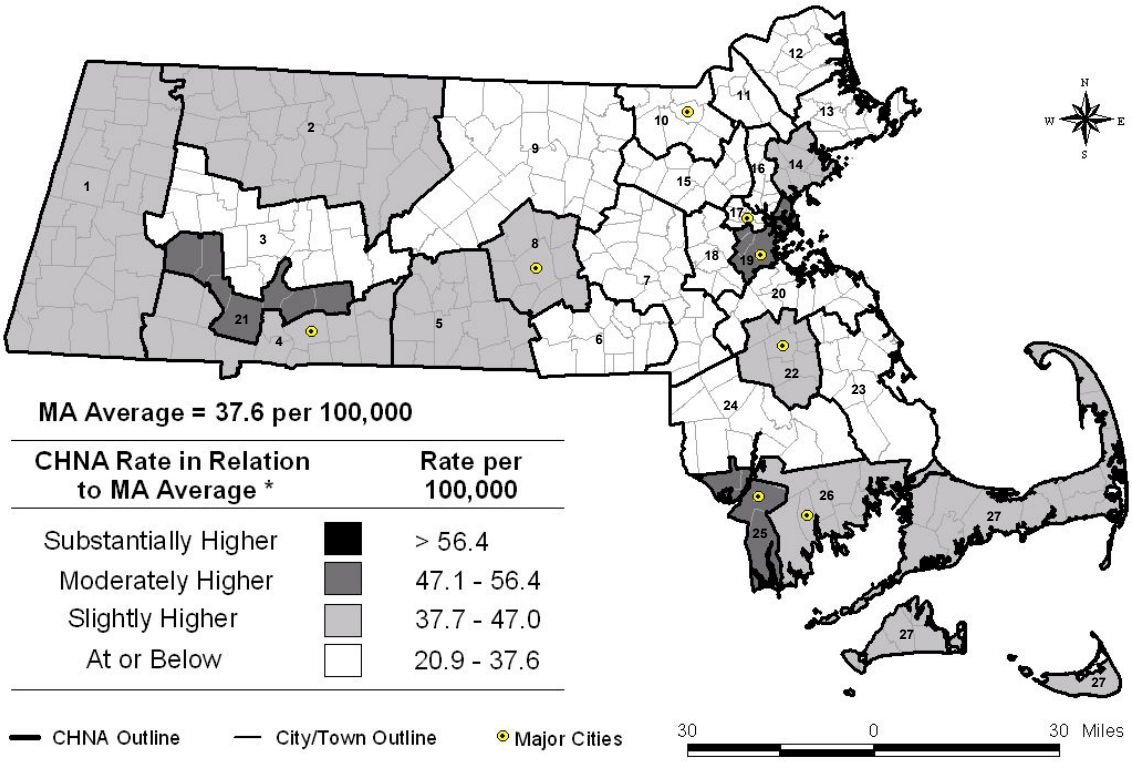
(N=23,907)

Data Source: Registry of Vital Records and Statistics, MA Department of Public Health.

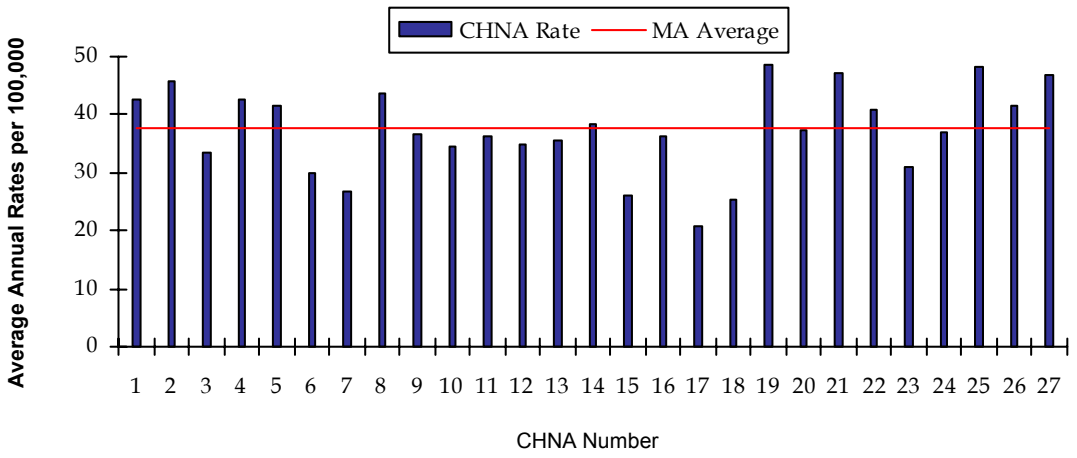
For 1992-2001:

- The five leading causes of injury death to Massachusetts residents were: poisoning (n=5,269), motor vehicle traffic (n=4,893), suffocation (n=2,741), firearm (n=2,373), and fall (n=2,165).
- Twenty-one percent of poisoning deaths were suicides, and 71% were of undetermined intent.
- Nineteen percent of motor vehicle traffic deaths were among pedestrians.
- Fifty-seven percent of suffocation deaths and 58% of firearm deaths were suicides.
- Sixty-five percent of fall deaths were among residents 65 years and older.

Figure 10. Average Annual Crude Total Injury Death Rates by CHNA of Residence, 1992-2001



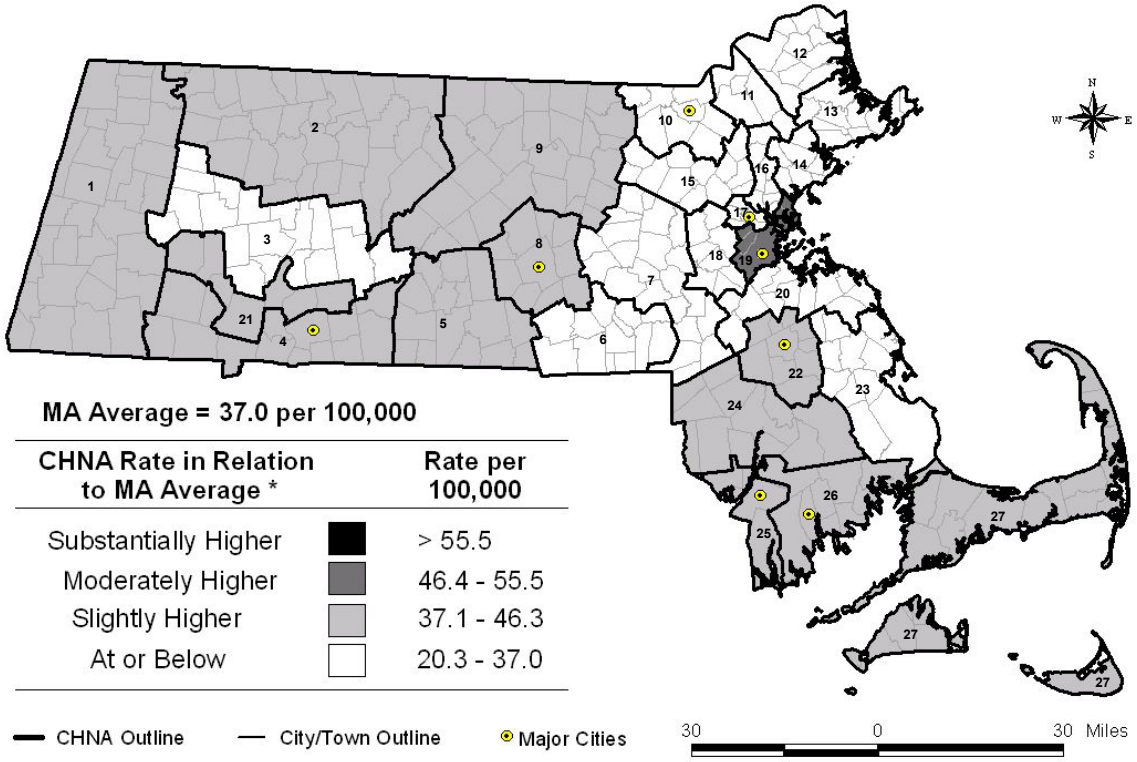
MA Average Number of Total Injury Deaths = 2,391 per year



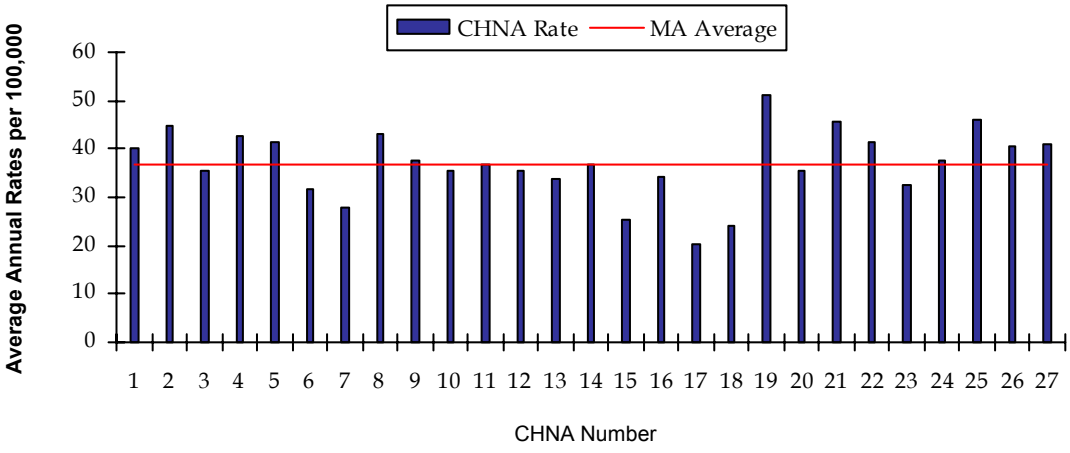
Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health;
Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 11. Average Annual Age-Adjusted Total Injury Death Rates by CHNA of Residence, 1992-2001



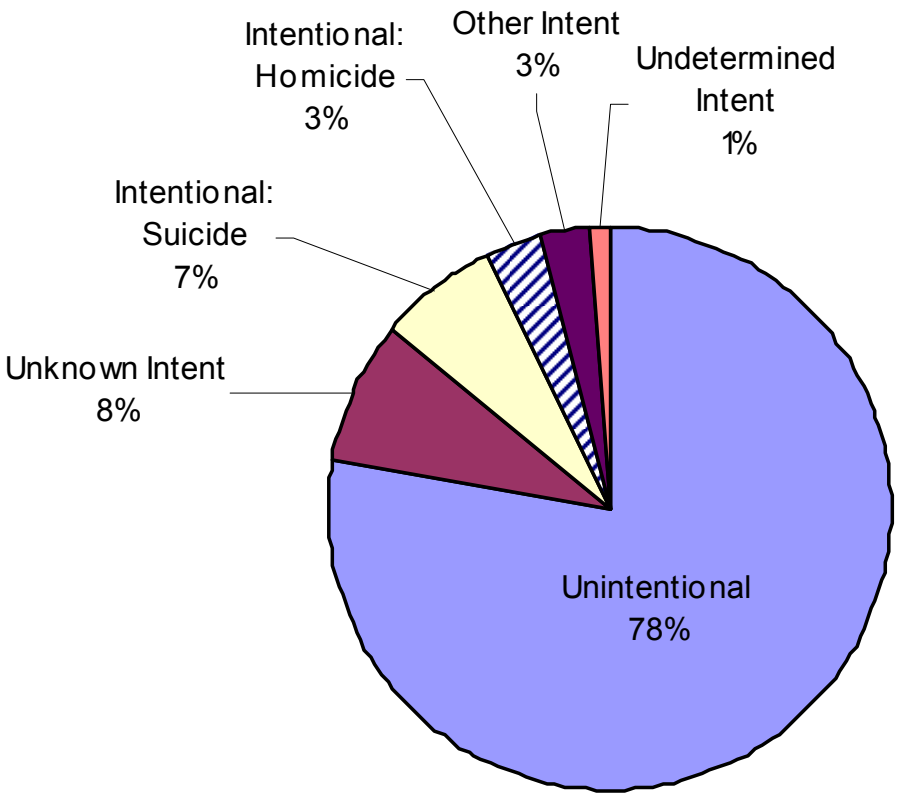
U.S. Average Annual Age-Adjusted Rate = 54.6 per 100,000



Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 12. Distribution of Total Injury Hospitalizations by Intent, Massachusetts Resident, FY1998-2002



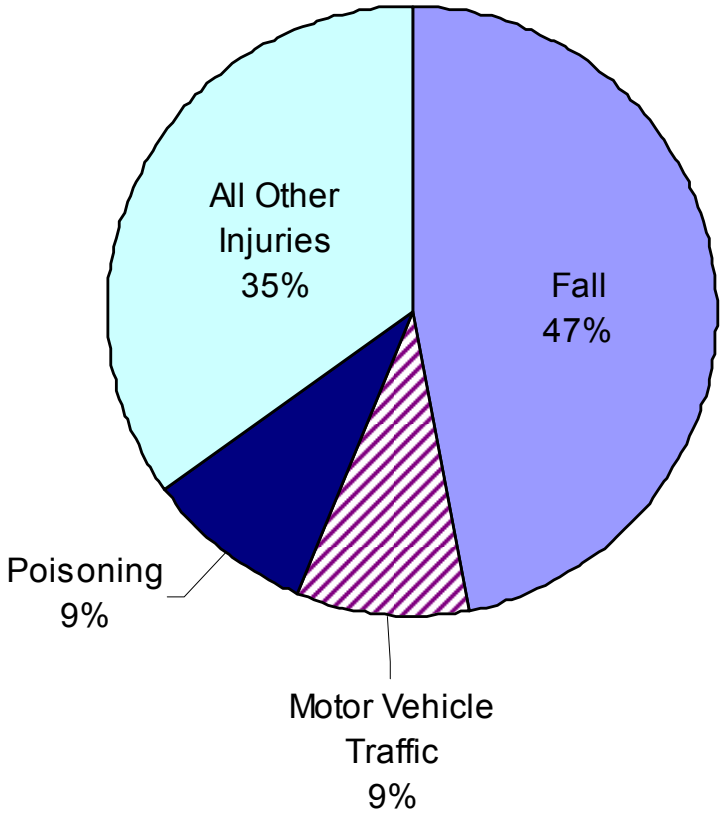
(N=248,275)

Data Source: Massachusetts Hospital Discharge Database, Massachusetts Division of Health Care Finance and Policy. Other Intent includes legal intervention and operations of war (n=7,284). Unknown Intent includes hospitalizations where no cause or intent was assigned (n=19,691).

For FY1998-2002:

- Unintentional injuries accounted for approximately 78% of all injury hospitalizations, 10% were intentionally inflicted, and 1% were injuries of undetermined intent.
- Of the 193,966 hospitalizations for unintentional injury among Massachusetts residents during the period FY1998-2002, 60% were due to falls, 11% were motor vehicle traffic-related, and 4% were poisonings.
- Of the 24,200 hospitalizations for intentional injury among Massachusetts residents during the period FY1998-2002, 70% were self-inflicted and 30% were due to an assault.

Figure 13. Distribution of Total Injury Hospitalizations by Cause, Massachusetts Residents, FY1998-2002



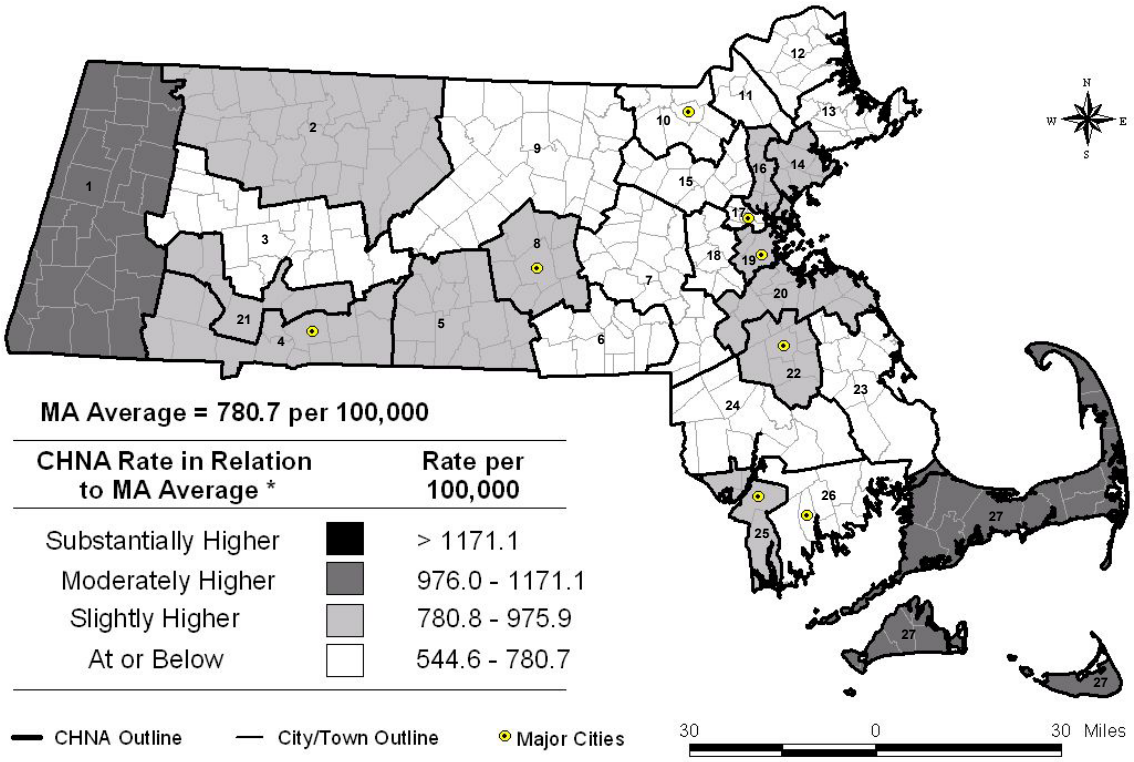
(N=248,275)

Data Source: Massachusetts Hospital Discharge Database, Massachusetts Division of Health Care Finance and Policy.

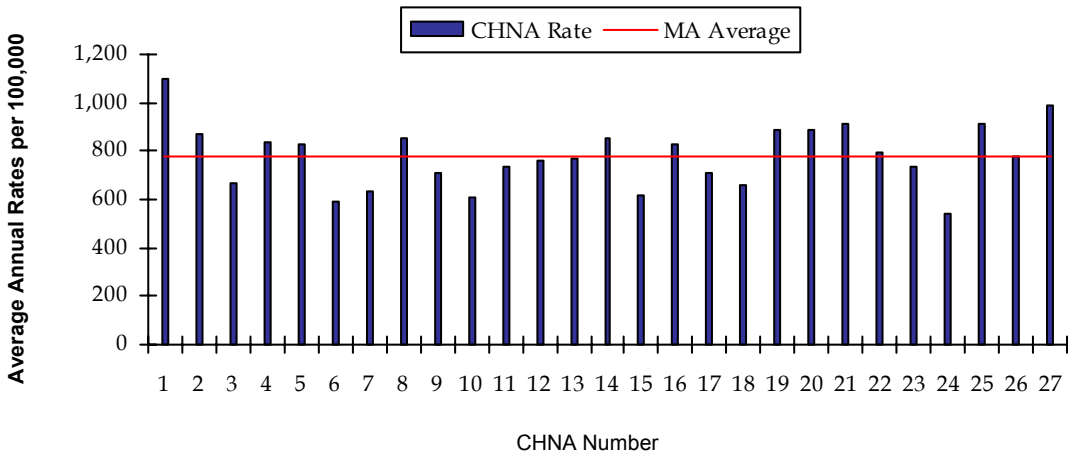
For FY1998-2002:

- The three leading causes of injury hospitalizations to Massachusetts residents were: fall (n=116,615), poisoning (n=23,133), and motor-vehicle traffic (n=21,566).
- Sixty-two percent of fall hospitalizations were due to a fall on the same level (by tripping or slipping).
- Among poisoning hospitalizations, 59% were self-inflicted.
- Sixty-seven percent of motor vehicle traffic injury hospitalizations were to occupants and 15% were to pedestrians.

Figure 14. Average Annual Crude Total Injury Hospitalization Rates by CHNA of Residence, FY1998-2002



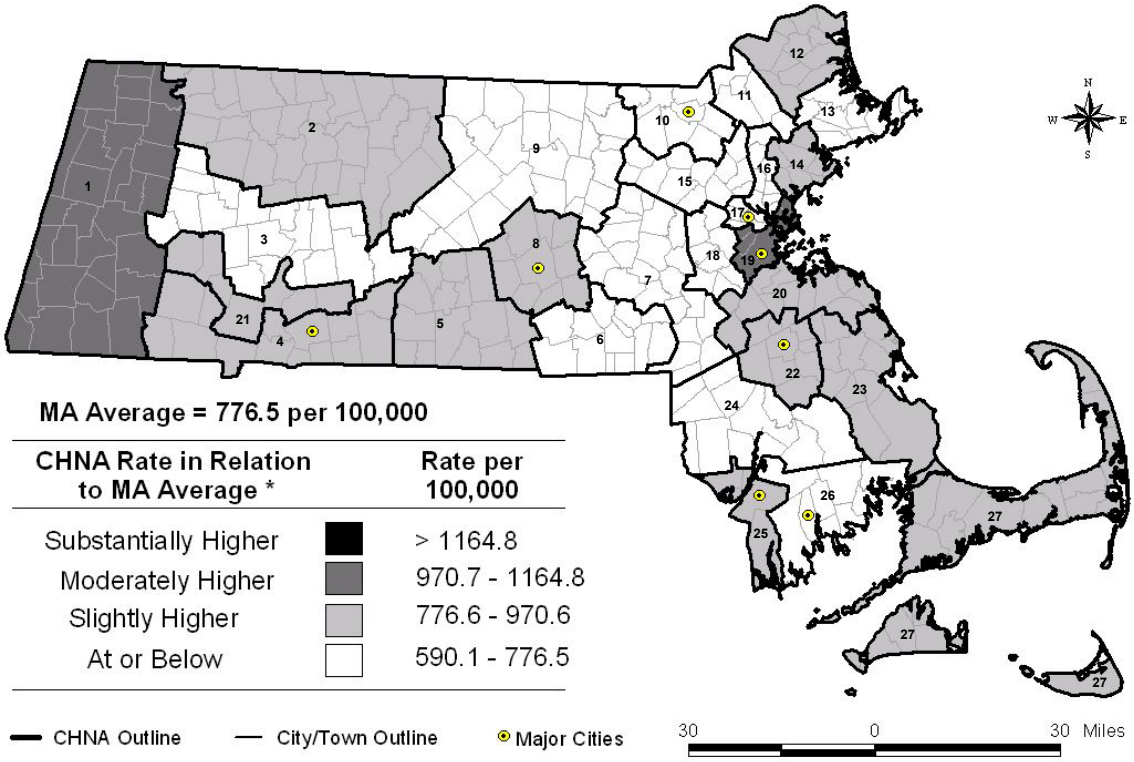
MA Average Number of Total Injury Hospitalizations = 49,655 per year

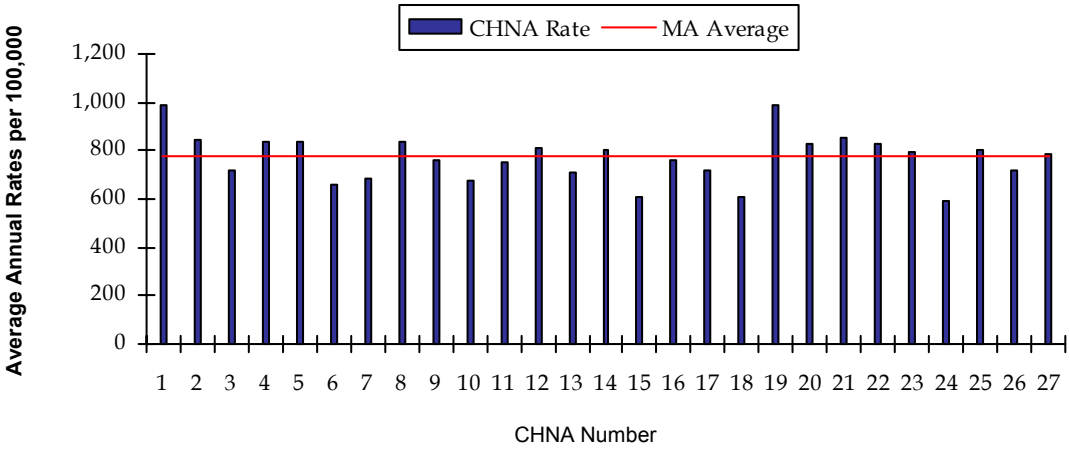


Data Sources: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 15. Average Annual Age-Adjusted Total Injury Hospitalization Rates by CHNA of Residence, FY1998-2002





Data Sources: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Section III: Average Annual Injury Rates by Intent of Injury

UNINTENTIONAL INJURY

Deaths

In Massachusetts, from 1992 through 2001, there were 12,871 unintentional injury deaths, for an average of 1,287 deaths per year and an average annual crude rate of 20.2 deaths per 100,000. The average annual age-adjusted rate in Massachusetts was 20.1 deaths per 100,000. In comparison, the U.S. average annual age-adjusted rate was 34.2 deaths per 100,000. The Massachusetts unintentional injury death rate was lower than the Healthy People 2010 Objective benchmark of 20.8 deaths per 100,000.

Hospitalizations

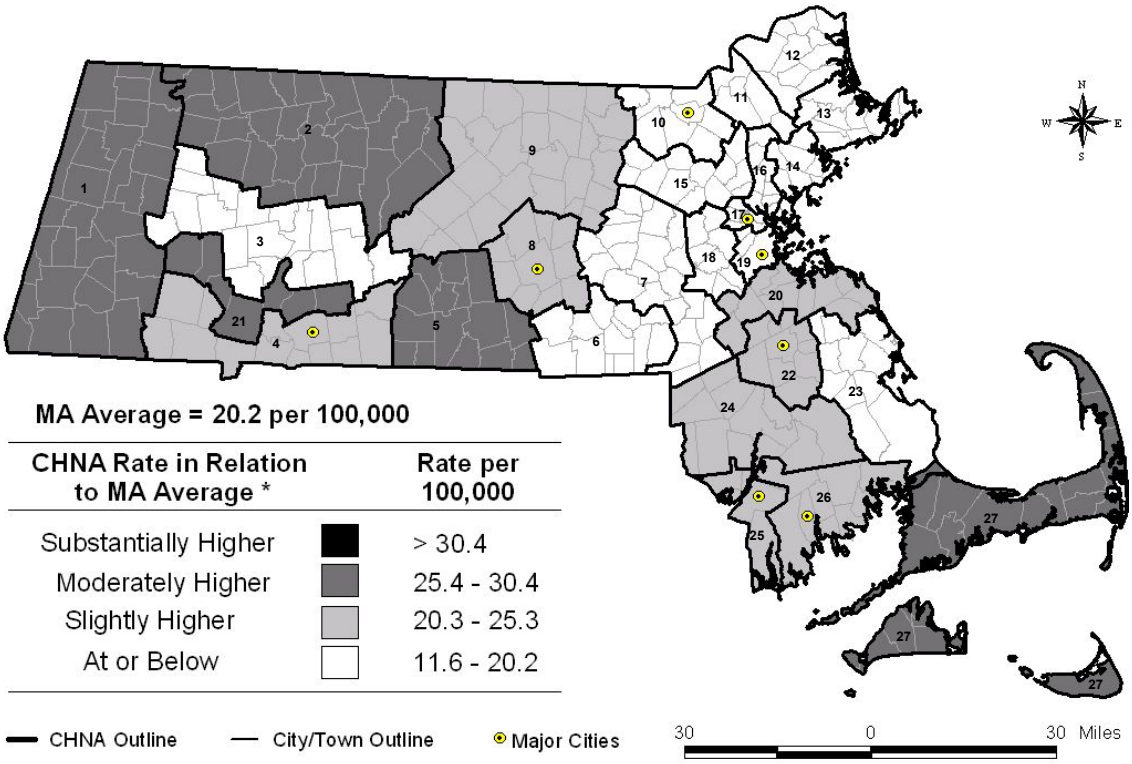
From 1998 through 2002, there were 193,966 hospitalizations for unintentional injury, for an average of 38,793 hospitalizations per year and an average annual crude rate of 609.9 hospitalizations per 100,000. The average annual age-adjusted rate in Massachusetts was 607.3 hospitalizations per 100,000.

Findings

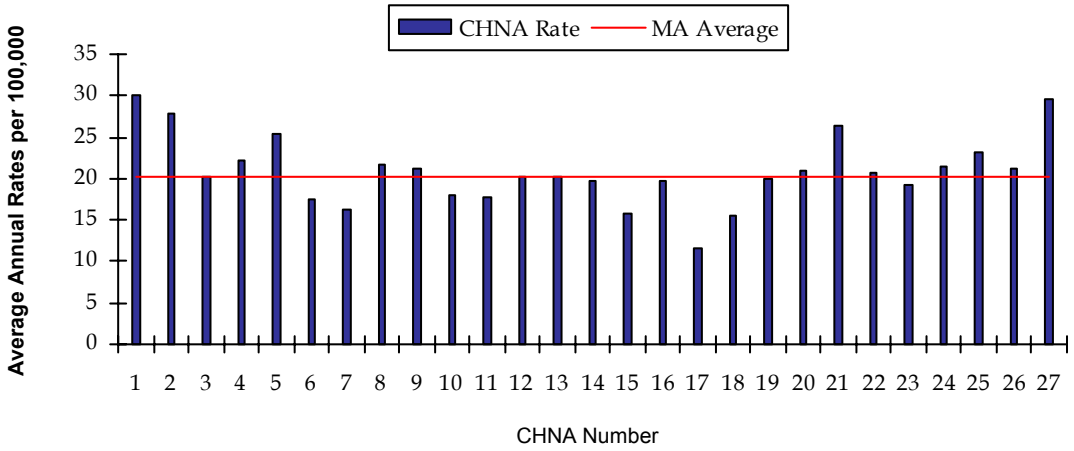
The highest crude unintentional injury death rates were observed in the geographic areas of the Community Health Network of Berkshire (CHNA 1), the Upper Valley Health Web (CHNA 2, the Franklin County area), the Common Pathways (CHNA 8, the greater Worcester area), the Community Health Network of Chicopee-Holyoke-Ludlow-Westfield (CHNA 21), and the Cape Cod and Islands Community Health Network (CHNA 27), where rates were moderately higher than the Massachusetts average. After adjusting for age, the areas of CHNAs 1, 2, and 8 remained moderately higher.

Among hospitalizations, moderately higher crude rates were observed in the areas of the CHNA of Berkshire and the Cape Cod and Islands CHNA. After adjusting for age, the CHNA of Berkshire area remained moderately higher than the Massachusetts average.

Figure 16. Average Annual Crude Unintentional Injury Death Rates by CHNA of Residence, 1992-2001



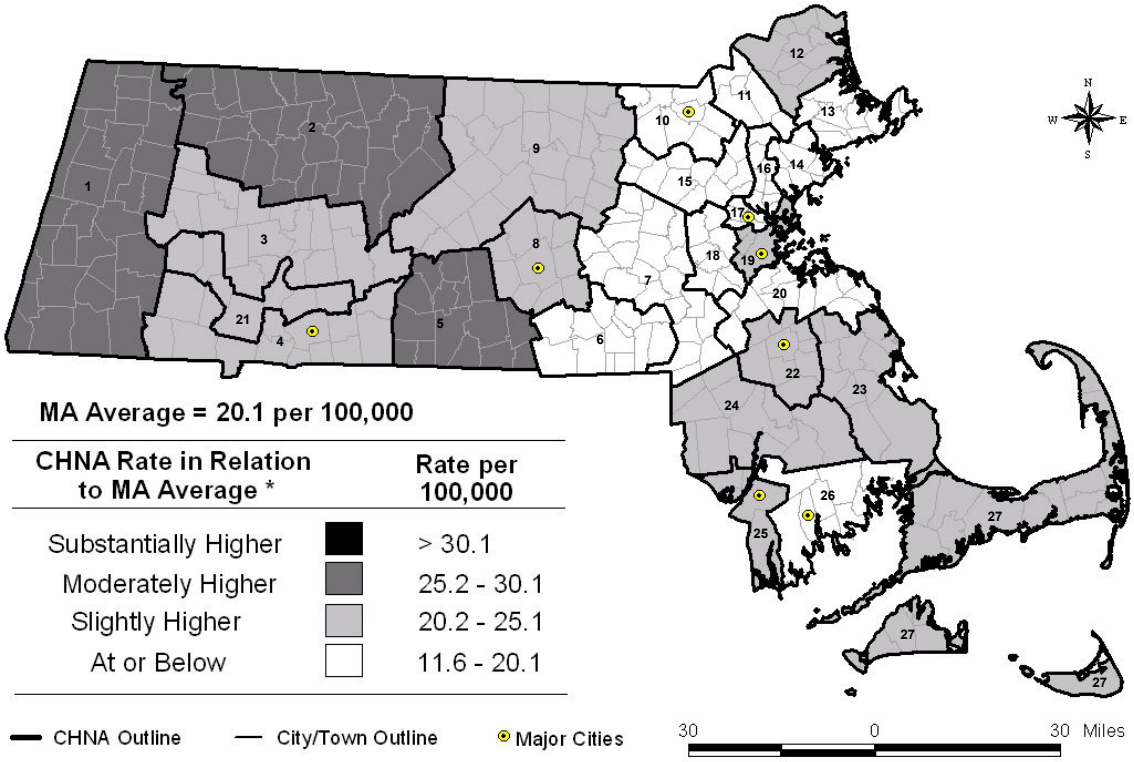
MA Average Number of Unintentional Injury Deaths = 1,287 per year



Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health;
Massachusetts Executive Office of Environmental Affairs, MassGIS.

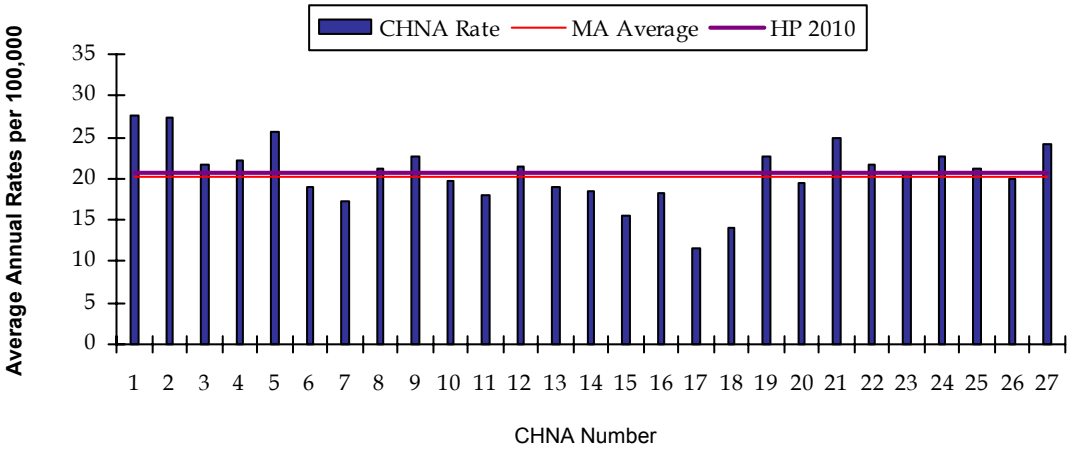
* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 17. Average Annual Age-Adjusted Unintentional Injury Death Rates by CHNA of Residence, 1992-2001



U.S. Average Annual Age-Adjusted Rate = 34.2 per 100,000

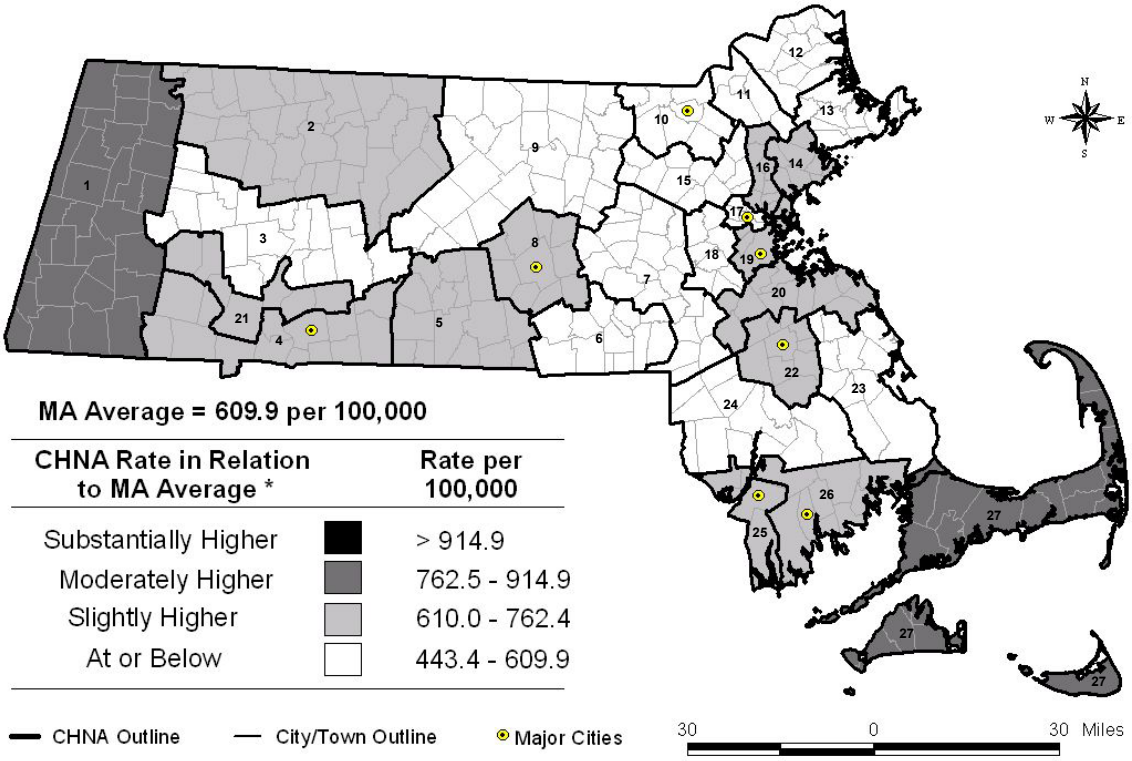
Healthy People 2010 Objective = 20.8 per 100,000



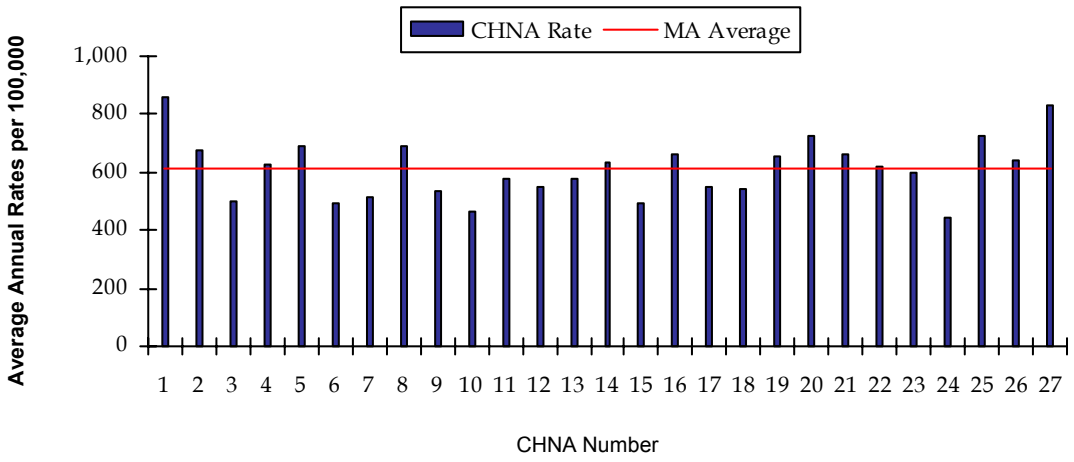
Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 18. Average Annual Crude Unintentional Injury Hospitalization Rates by CHNA of Residence, FY1998-2002



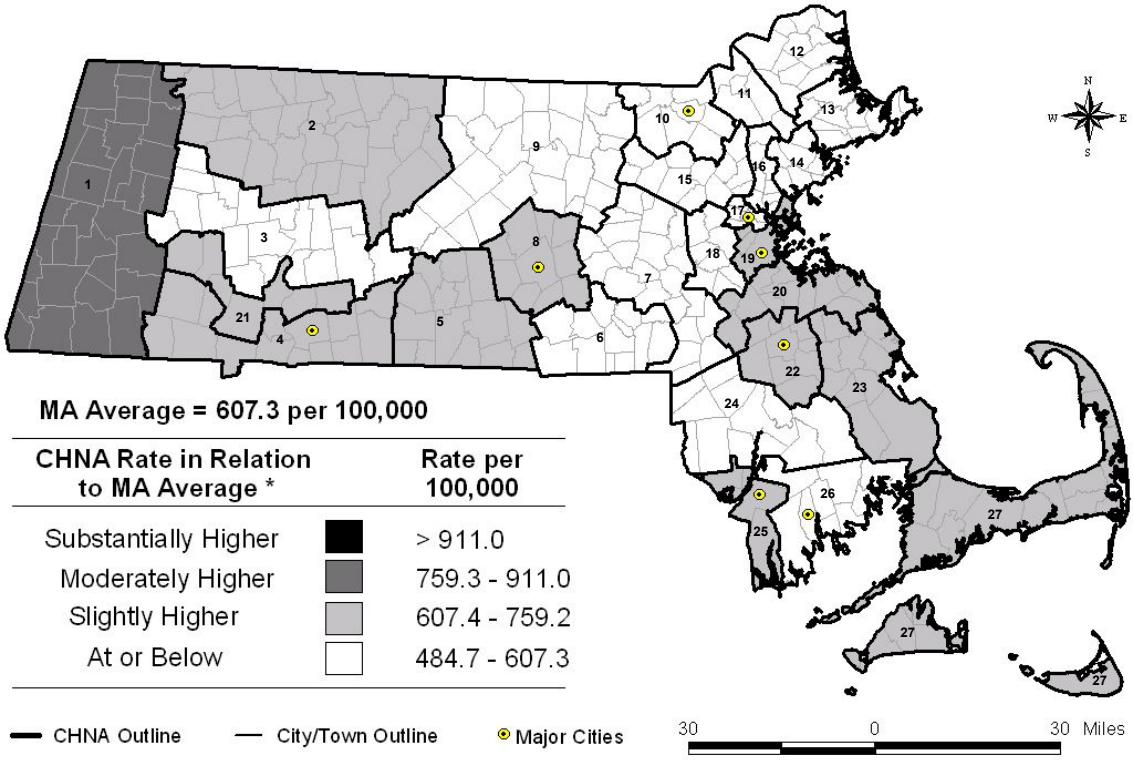
MA Average Number of Unintentional Injury Hospitalizations = 38,793 per year

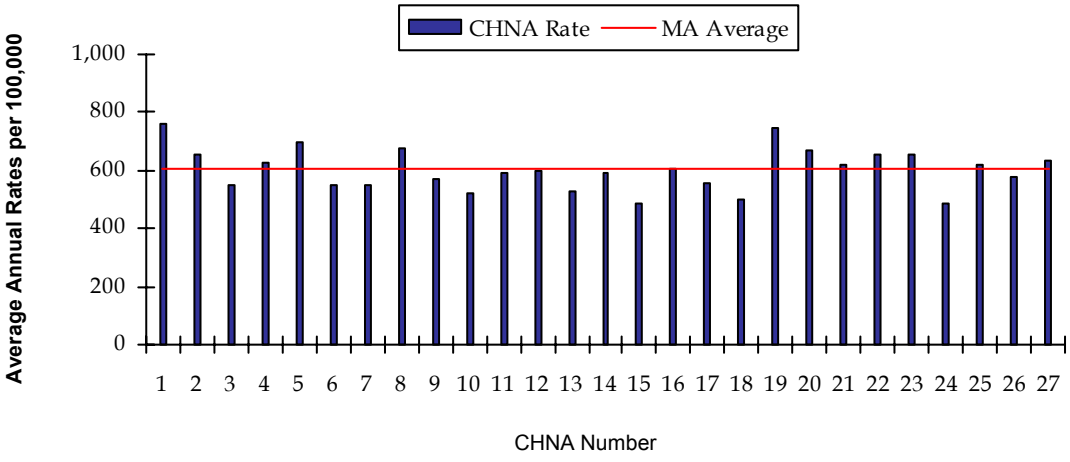


Data Sources: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 19. Average Annual Age-Adjusted Unintentional Injury Hospitalization Rates by CHNA of Residence, FY1998-2002





Data Sources: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

SELF-INFLICTED INJURY

Deaths

In Massachusetts, from 1992 through 2001, there were 4,733 suicides, for an average of 473 deaths per year and an average annual crude rate of 7.4 deaths per 100,000. The average annual age-adjusted rate in Massachusetts was 7.3 deaths per 100,000. In comparison, the U.S. average annual age-adjusted rate was 11.3 deaths per 100,000.

Hospitalizations

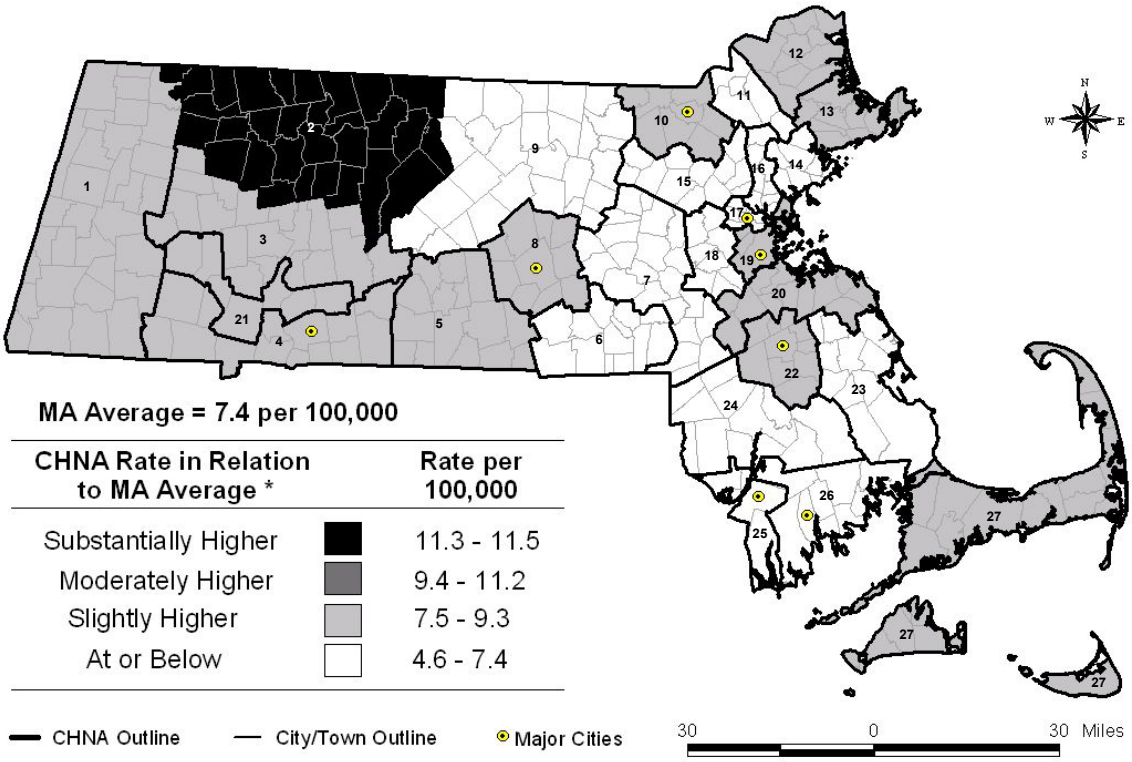
From 1998 through 2002, there were 16,933 hospitalizations for self-inflicted injury, for an average of 3,399 hospitalizations per year and an average annual crude rate of 53.4 hospitalizations per 100,000. The average annual age-adjusted rate in Massachusetts was 52.4 hospitalizations per 100,000.

Findings

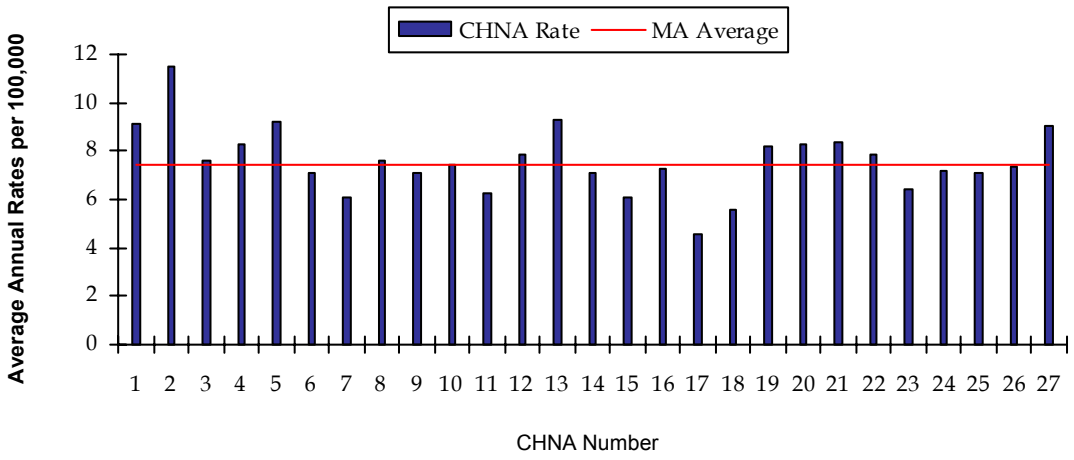
The highest crude suicide rate was observed in the geographic area of the Upper Valley Health Web (CHNA 2, Franklin County area), where the rate was substantially higher than the Massachusetts average. All other suicide rates were either slightly higher, at, or below the state average. Suicide rates for the CHNA 2 area are substantially higher than the state average because in 1992 there were 21 suicides while in 1993-2001 there was an average of 9 suicides per year. Adjusting for age made little difference to the map.

The geographic area of CHNA 2 had the highest rate of self-inflicted injury hospitalization and was the only area with a rate substantially higher than the state average. The areas of the Community Health Network of Berkshire (CHNA 1), the Community Health Connection (CHNA 4, the Springfield area), the North Shore Community Health Network (CHNA 14, the Lynn area), the Community Health Network of Chicopee-Holyoke-Ludlow-Westfield (CHNA 21), and the Greater Brockton Community Health Network (CHNA 22) had moderately higher crude hospitalization rates. In the age-adjusted map, the rate in the area of the Partners for Healthier Communities (CHNA 25, the Fall River area) was moderately higher than the Massachusetts average.

Figure 20. Average Annual Crude Suicide Rates by CHNA of Residence, 1992-2001



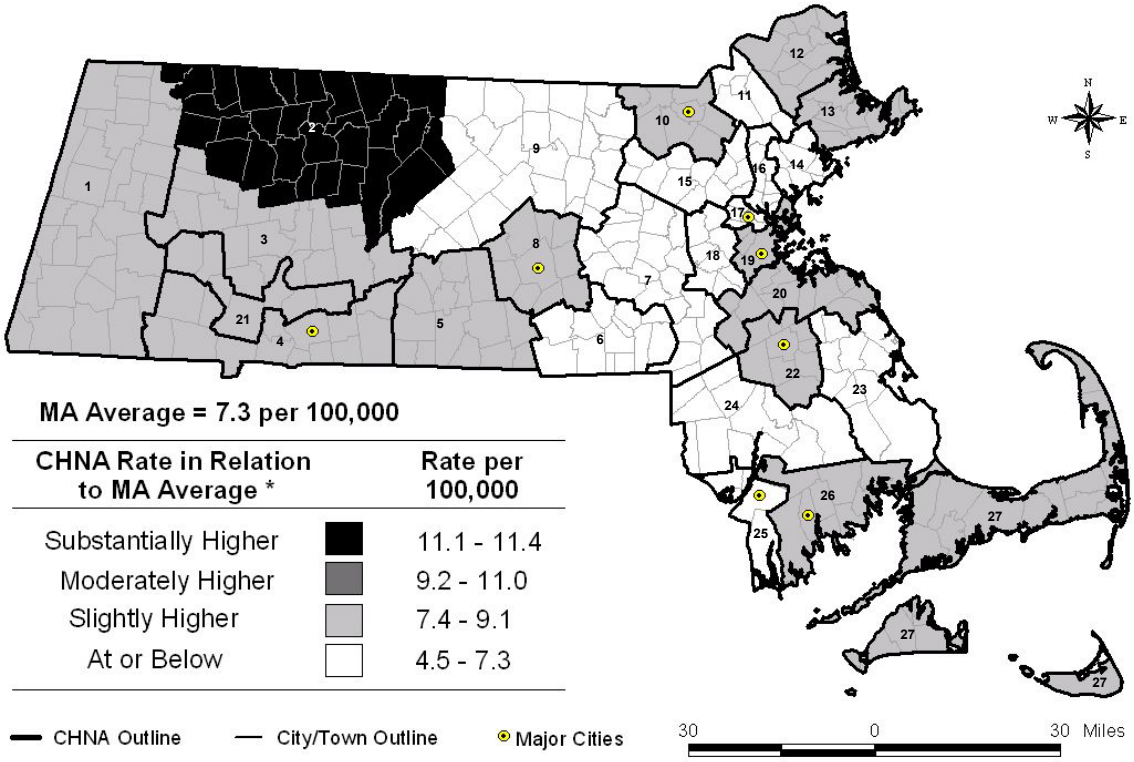
MA Average Number of Suicides = 473 per year



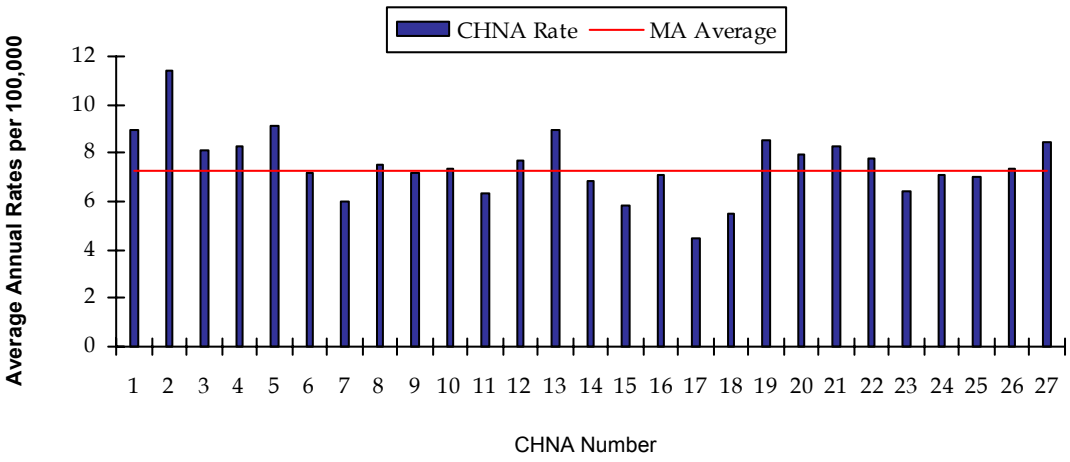
Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health;
Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 21. Average Annual Age-Adjusted Suicide Rates by CHNA of Residence, 1992-2001



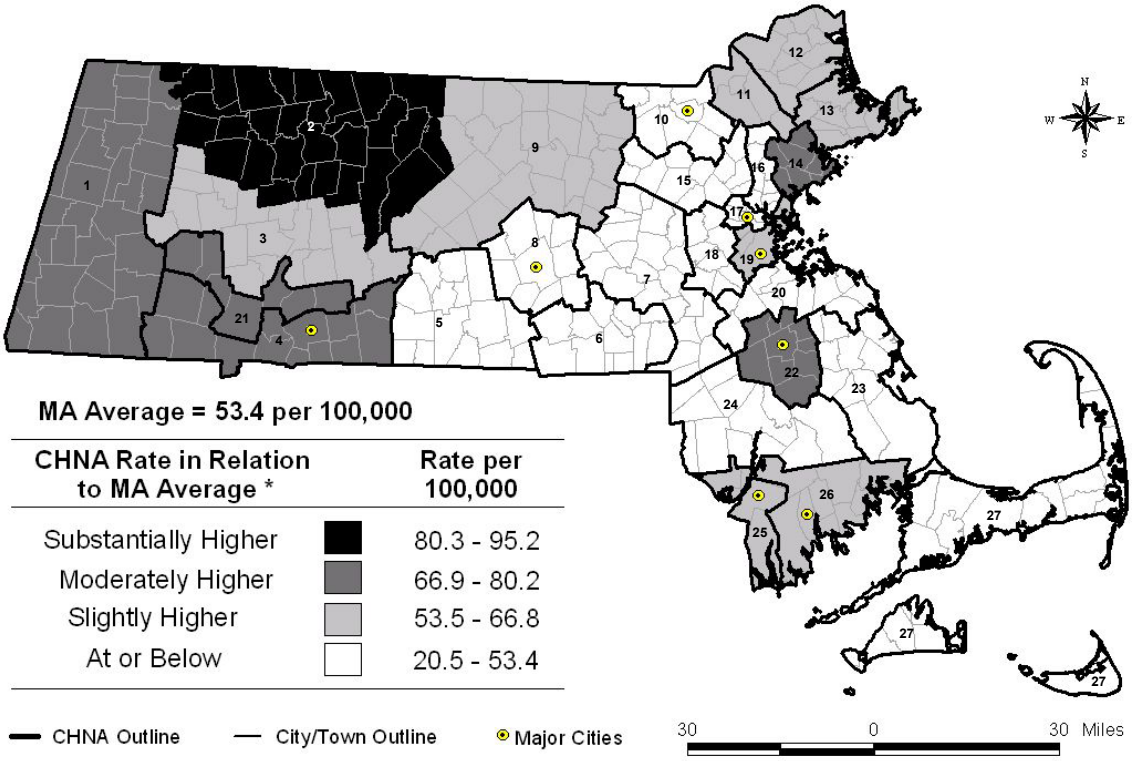
U.S. Average Annual Age-Adjusted Rate = 11.3 per 100,000



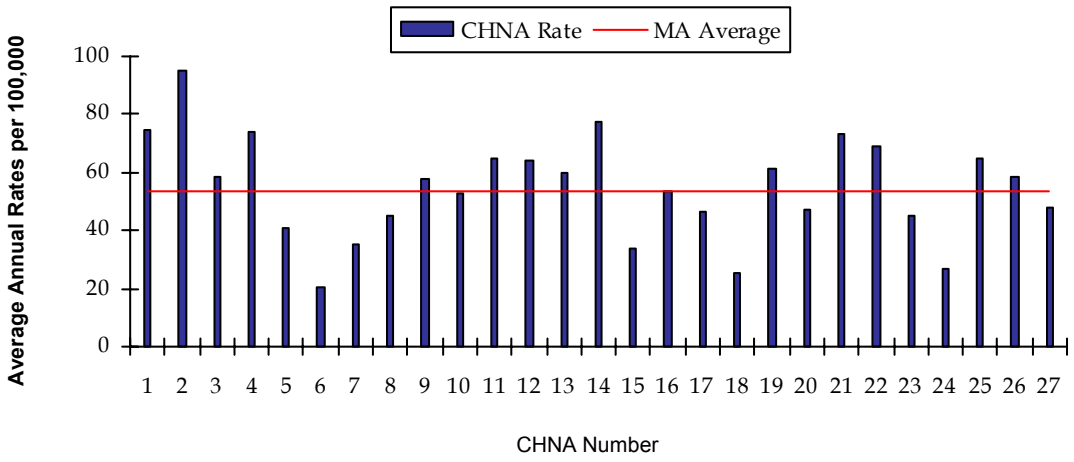
Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 22. Average Annual Crude Self-Inflicted Injury Hospitalization Rates by CHNA of Residence, FY1998-2002



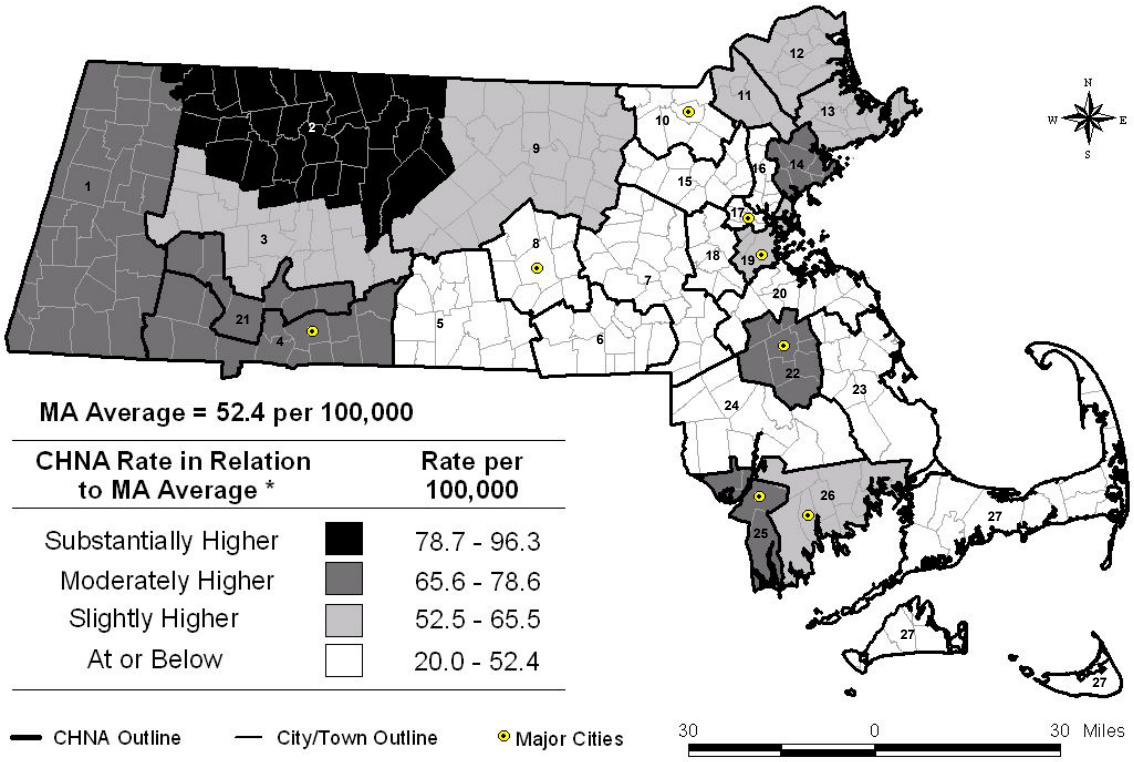
MA Average Number of Self-Inflicted Hospitalizations = 3,399 per year

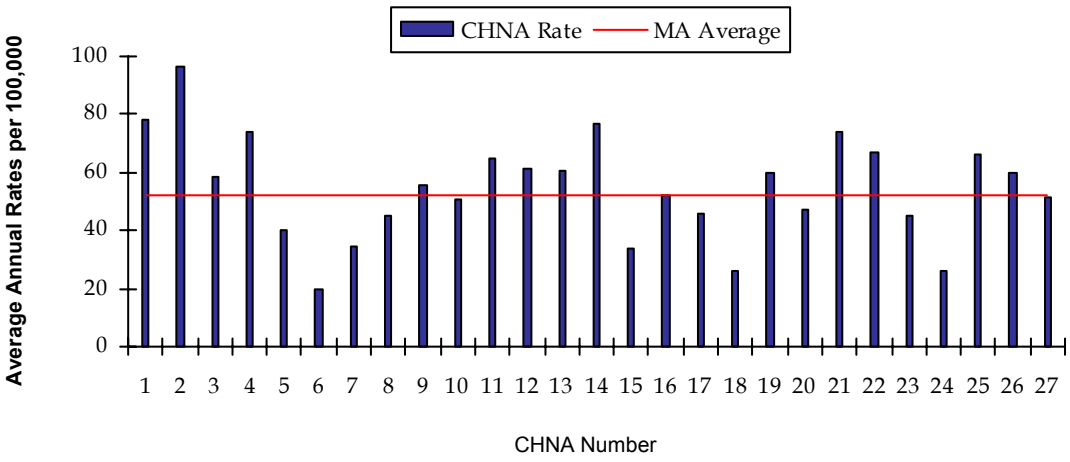


Data Sources: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 23. Average Annual Age-Adjusted Self-Inflicted Injury Hospitalization Rates by CHNA of Residence, FY1998-2002





Data Sources: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

ASSAULT INJURY

Deaths

In Massachusetts, from 1992 through 2001, there were 1,787 homicides, for an average of 179 deaths per year and an average annual crude rate of 2.8 deaths per 100,000. The average annual age-adjusted rate in Massachusetts was 2.8 per 100,000. In comparison, the U.S. average annual age-adjusted rate was 7.6 deaths per 100,000. The Massachusetts homicide rate was lower than the Healthy People 2010 Objective benchmark of 3.2 deaths per 100,000.

Hospitalizations

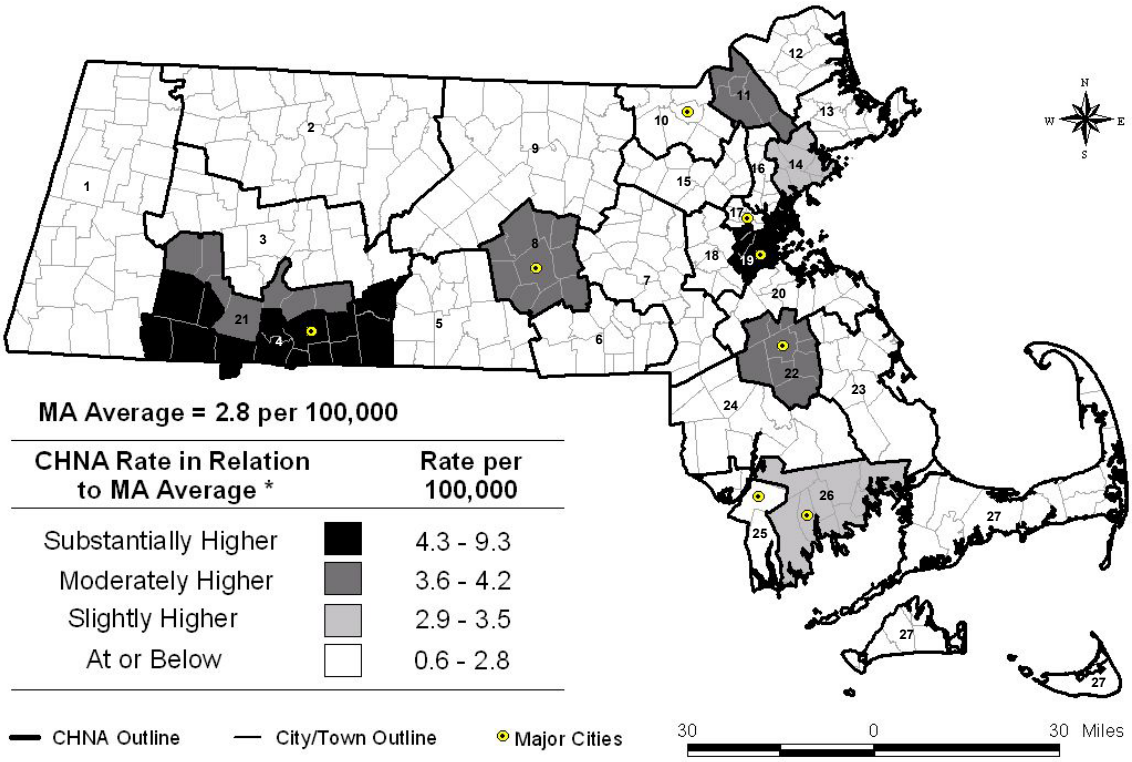
From 1998 through 2002, there were 7,207 assault injury-related hospitalizations, for an average of 1,441 hospitalizations per year and an average annual crude rate of 22.7 hospitalizations per 100,000. The average annual age-adjusted rate in Massachusetts was 22.4 hospitalizations per 100,000.

Findings

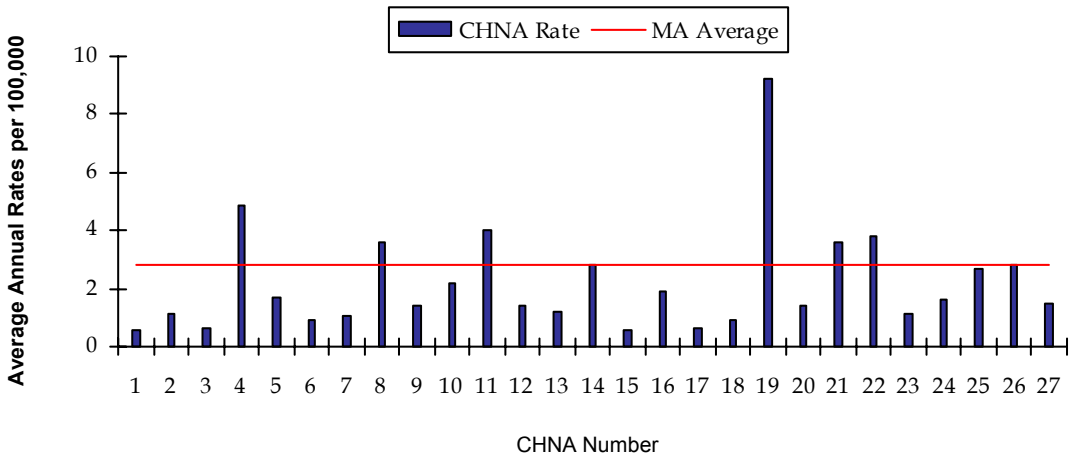
The highest crude homicide rates were observed in the geographic areas of the Community Health Connection (CHNA 4, the Springfield area) and the Alliance for Community Health (CHNA 19, the Boston area), where rates were substantially higher than the Massachusetts average. The rate in the area of CHNA 19 was 9.3 homicides per 100,000, which was almost twice as high as in the area of CHNA 4. Crude rates in the geographic areas of the Common Pathways (CHNA 8, the greater Worcester area), the Greater Lawrence Community Health Network (CHNA 11), the Community Health Network of Chicopee-Holyoke-Ludlow-Westfield (CHNA 21), and the Greater Brockton Community Health Network (CHNA 22) were moderately higher than the Massachusetts average. Adjusting for age did not change the map.

Assault-related hospitalizations were substantially higher than the Massachusetts average in the area of CHNA 19; the areas of CHNAs 4, 8, and 11 have moderately higher rates. The age-adjusted map shows little difference from the crude map.

Figure 24. Average Annual Crude Homicide Rates by CHNA of Residence, 1992-2001



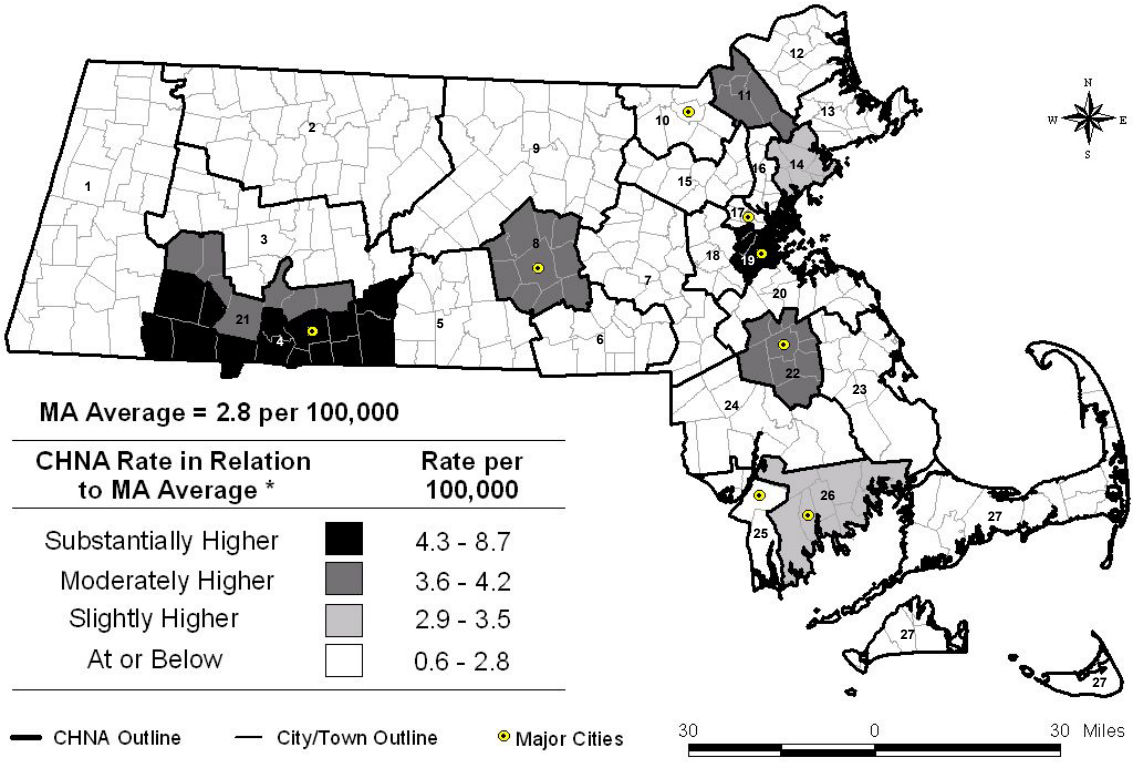
MA Average Number of Homicides = 179 per year



Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health;
Massachusetts Executive Office of Environmental Affairs, MassGIS.

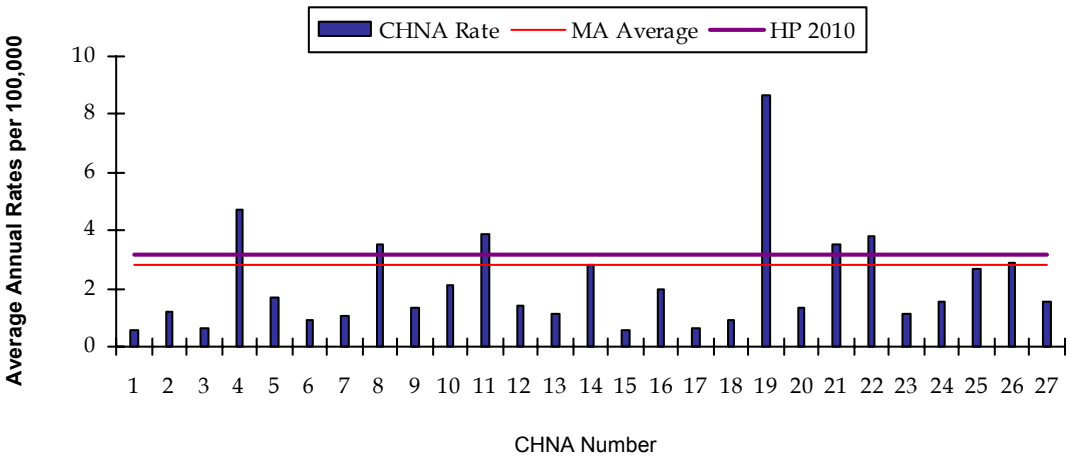
* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 25. Average Annual Age-Adjusted Homicide Rates by CHNA of Residence, 1992-2001



U.S. Average Annual Age-Adjusted Rate = 7.6 per 100,000

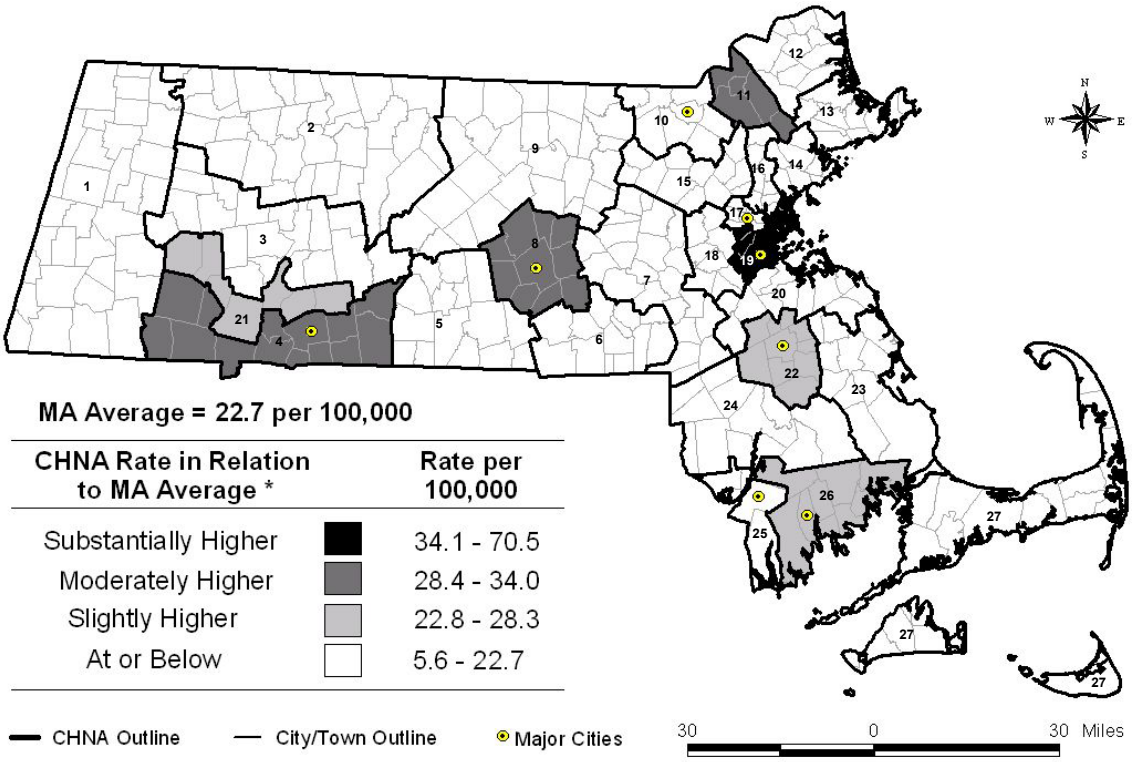
Healthy People 2010 Objective = 3.2 per 100,000



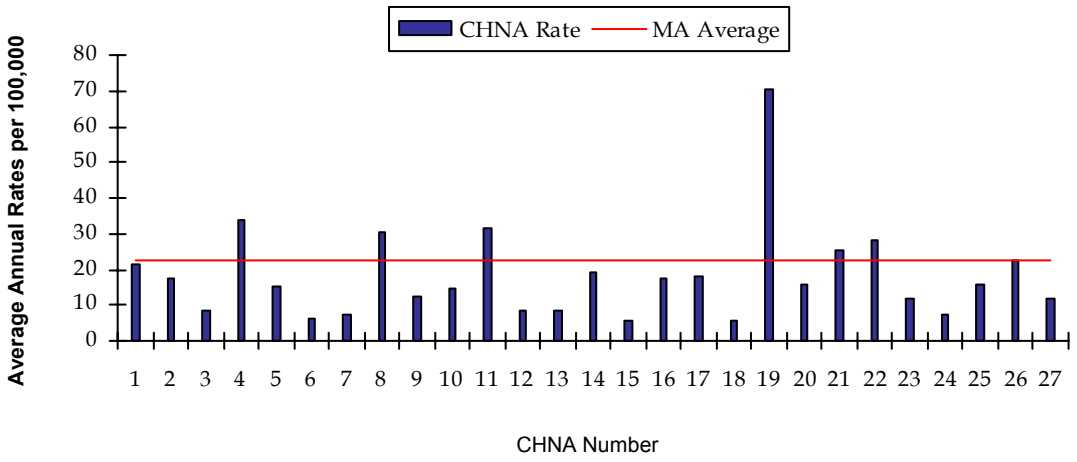
Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 26. Average Annual Crude Assault Injury Hospitalization Rates by CHNA of Residence, FY1998-2002



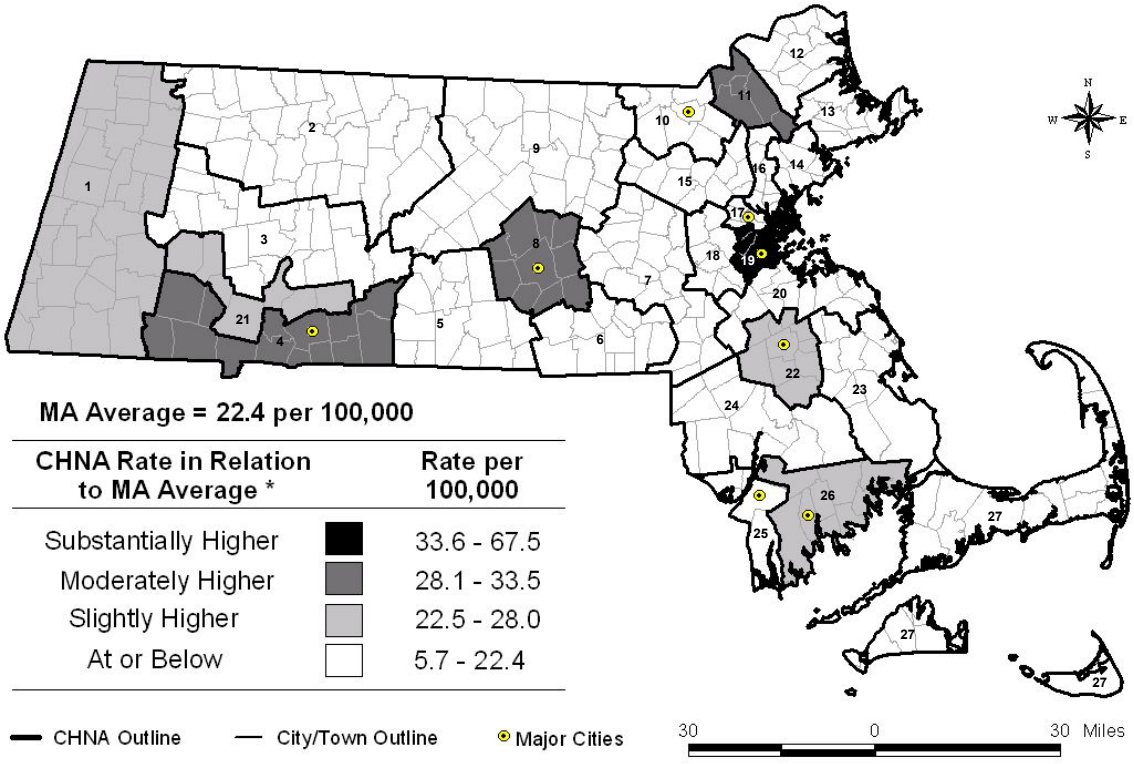
MA Average Number of Assault-Related Hospitalizations = 1,441 per year

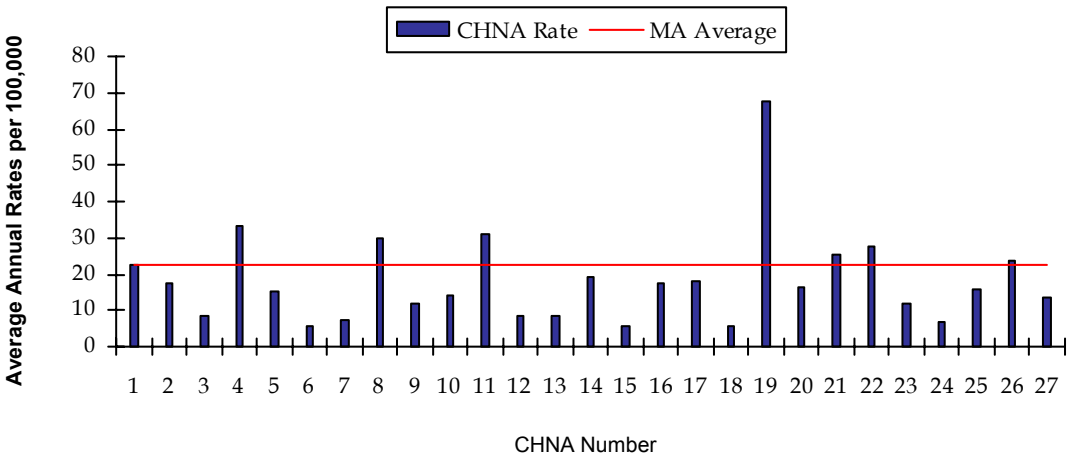


Data Sources: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 27. Average Annual Age-Adjusted Assault Injury Hospitalization Rates by CHNA of Residence, FY1998-2002





Data Sources: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

INJURY OF UNDETERMINED INTENT

Deaths

In Massachusetts, from 1992 through 2001, there were 4,094 injury deaths of undetermined intent, for an average of 409 deaths per year and an average annual crude rate of 6.4 deaths per 100,000. The average annual age-adjusted death rate in Massachusetts was 6.2 deaths per 100,000. In comparison, the U.S. average annual age-adjusted rate* was 1.3 deaths per 100,000. Ninety-two percent of all injury deaths of undetermined intent were caused by poisonings, which includes drug overdoses.

Hospitalizations

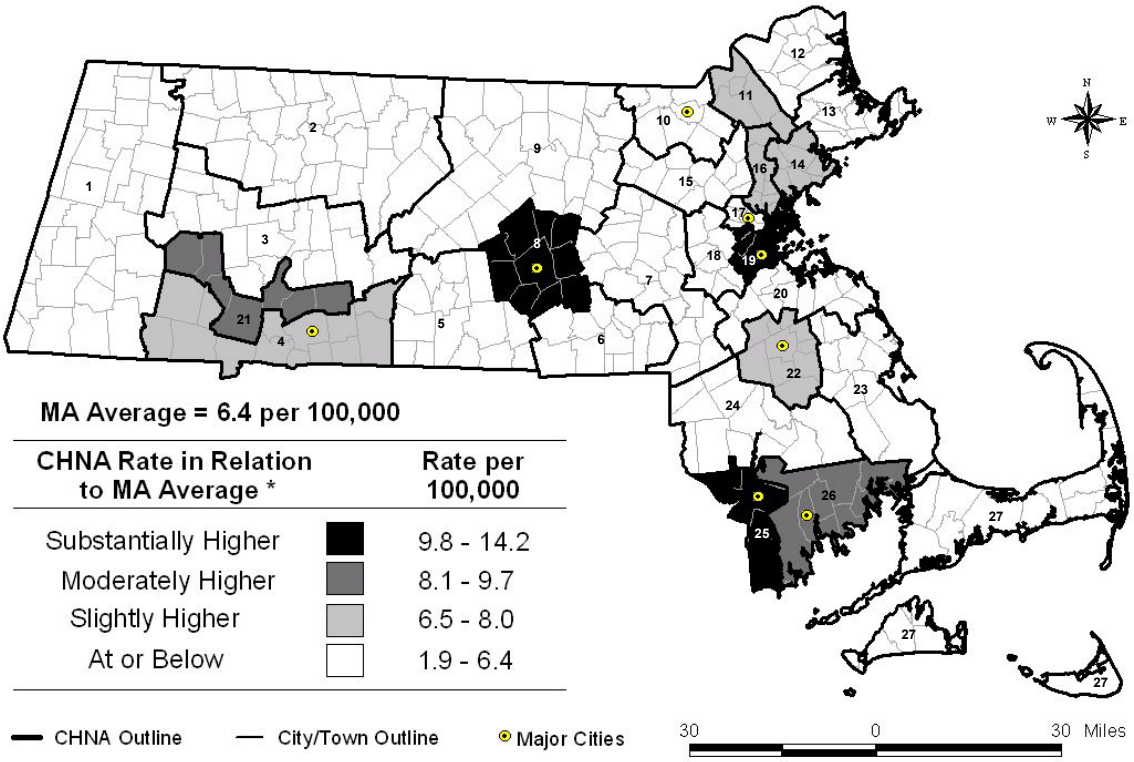
From 1998 through 2002, there were 3,134 injury-related hospitalizations of undetermined intent, for an average of 627 hospitalizations per year and an average annual crude rate of 9.9 hospitalizations per 100,000. The average annual age-adjusted rate in Massachusetts was 9.6 hospitalizations per 100,000. Injury hospitalizations of undetermined intent represented only 1% of total injury hospitalizations. Because of the small numbers, injury hospitalization rates of undetermined intent were not mapped.

Findings

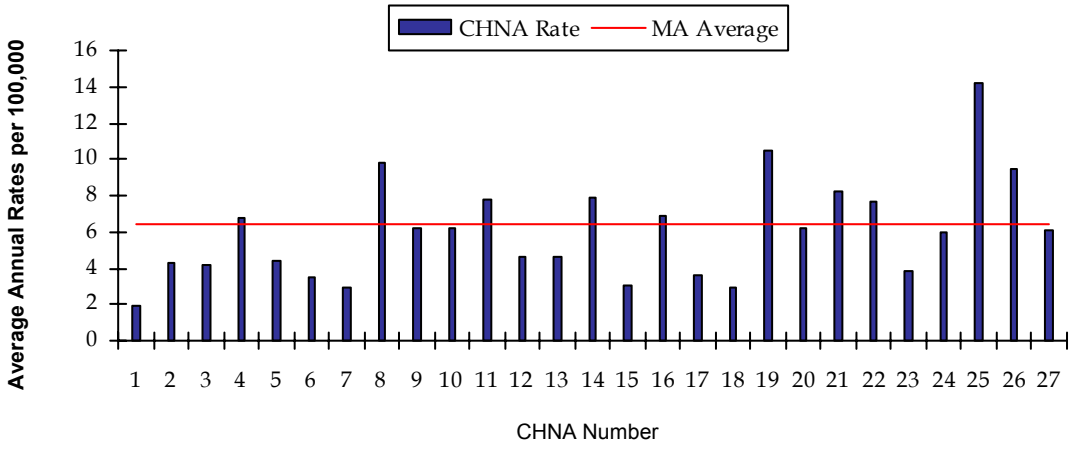
For injury deaths of undetermined intent, the medical examiner lacked sufficient evidence to classify the death as homicide, suicide, or accidental. Massachusetts has one of the highest rates of undetermined injury death, almost five times the U.S. rate.* The highest undetermined crude death rates were observed in the geographic areas of the Common Pathways (CHNA 8, the greater Worcester area), the Alliance for Community Health (CHNA 19, the Boston area), and the Partners for Healthier Communities (CHNA 25, the Fall River area), where the rates were substantially higher than the Massachusetts average. The areas of the Community Health Network of Chicopee-Holyoke-Ludlow-Westfield (CHNA 21) and the Greater New Bedford Community Health Network (CHNA 26) had rates that were moderately higher. After adjusting for age, the area of the Greater Lawrence Community Health Network (CHNA 11) was moderately higher than the Massachusetts average, and the area of the Greater New Bedford CHNA was substantially higher. The areas with elevated injury rates of undetermined intent are the same areas with elevated poisoning death rates (Figures 36 and 37).

* Please refer to the Limitations section (page xi) for interpreting differences between U.S. and MA rates.

Figure 28. Average Annual Crude Injury Death Rates of Undetermined Intent by CHNA of Residence, 1992-2001



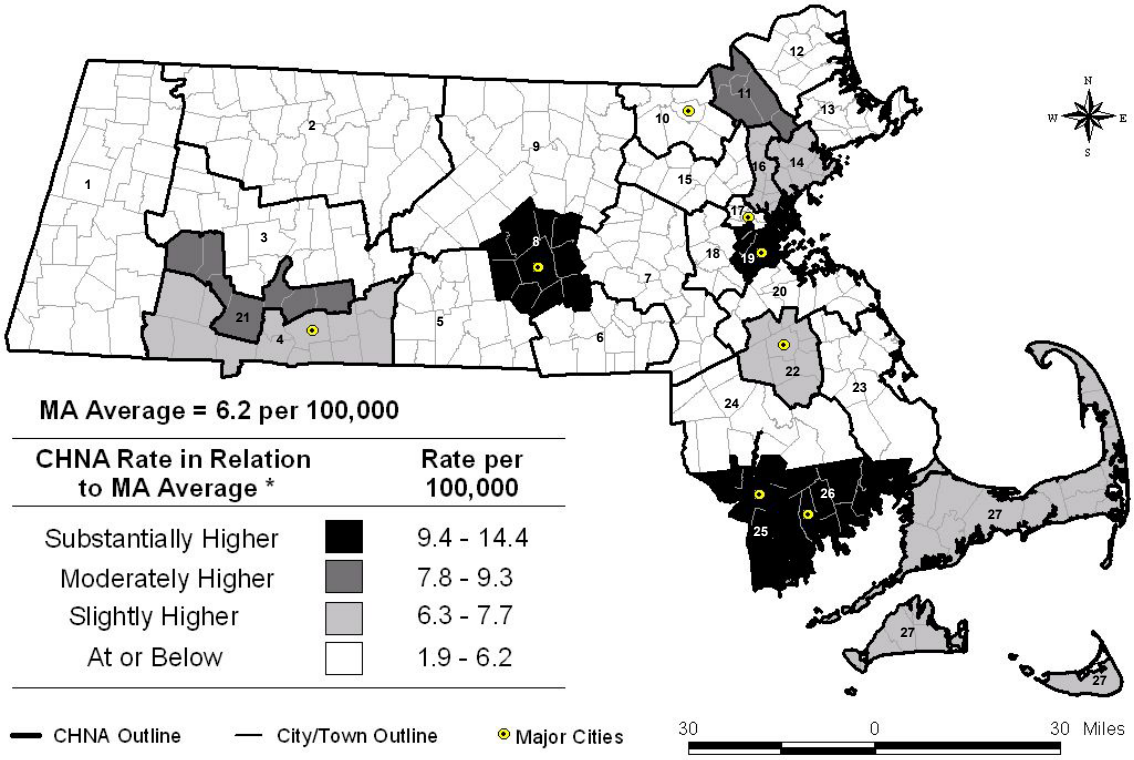
MA Average Number of Injury Deaths of Undetermined Intent = 409 per year



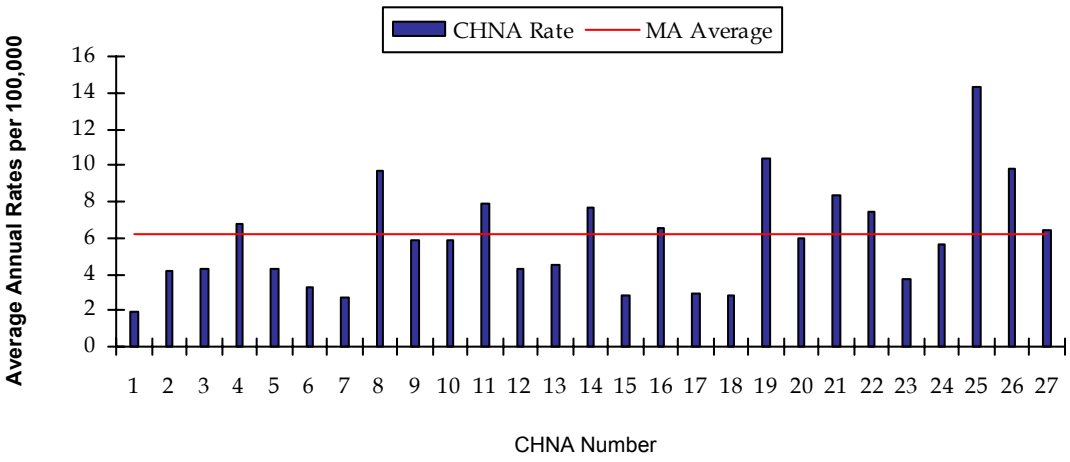
Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health;
Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 29. Average Annual Age-Adjusted Injury Death Rates of Undetermined Intent by CHNA of Residence, 1992-2001



U.S. Average Annual Age-Adjusted Rate = 1.3 per 100,000



Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Section IV: Average Annual Injury Rates by Cause of Injury

FIREARM INJURY

Background

Firearm injuries include wounds from guns that sustain an explosive charge of gunpowder such as handguns, shotguns, hunting rifles, military firearms, flares, or unspecified guns. Injuries resulting from guns powered by compressed air, gas or other mechanical means are not included (e.g., BB guns). The majority (58%) of all firearm fatalities from 1992-2001 were suicides. Firearms were the leading cause of homicides in Massachusetts and were responsible for 52% of the homicides among Massachusetts residents from 1992-2001.

Deaths

In Massachusetts, from 1992 through 2001, there were 2,373 firearm deaths, for an average of 237 deaths per year and an average annual crude rate of 3.7 deaths per 100,000. The average annual age-adjusted rate in Massachusetts was 3.7 deaths per 100,000. In comparison, the U.S. average annual age-adjusted rate was 12.4 deaths per 100,000. The Massachusetts average annual age-adjusted firearm death rate was also below the Healthy People 2010 Objective benchmark of 4.9 deaths per 100,000. Firearms were the fourth leading cause of injury deaths from 1992-2001.

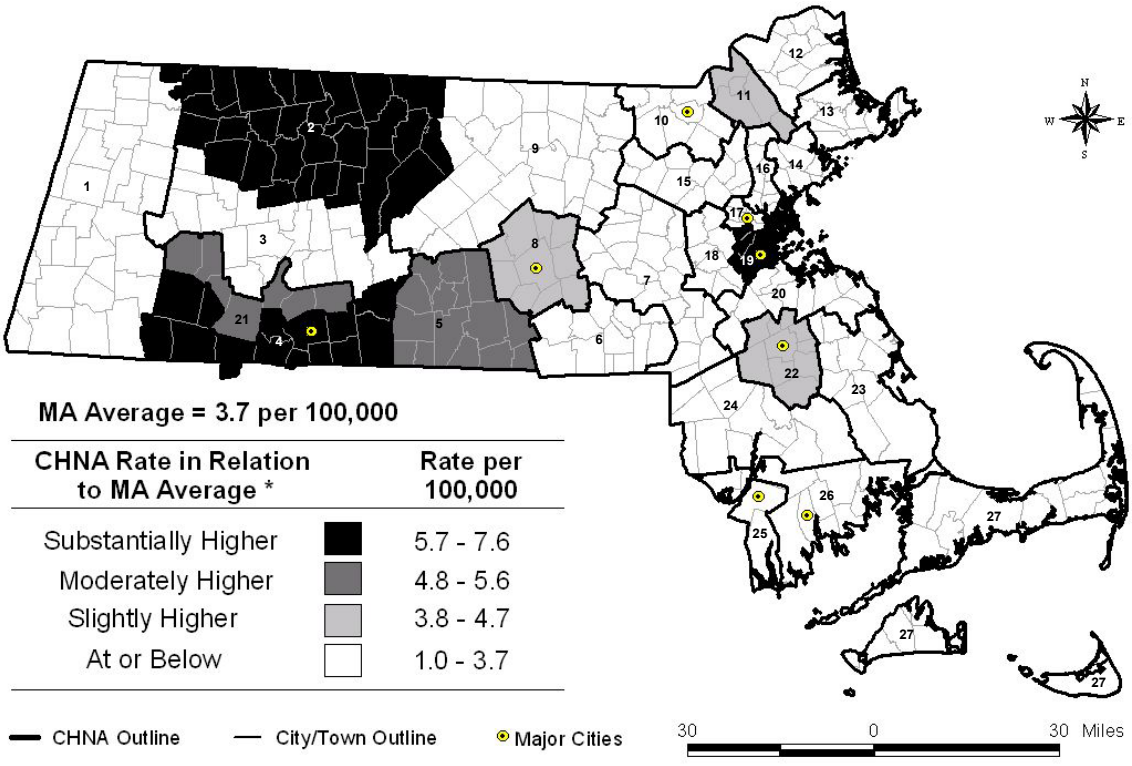
Hospitalizations

From 1998 through 2002, there were 1,065 firearm-related hospitalizations, for an average of 213 hospitalizations per year and an average annual crude rate of 3.3 hospitalizations per 100,000. The average annual age-adjusted rate in Massachusetts was 3.3 hospitalizations per 100,000. Because of the lethal nature of this injury, the numbers of non-fatal firearm injuries were lower than injuries from other causes. Therefore, hospitalization rates for this injury were not mapped.

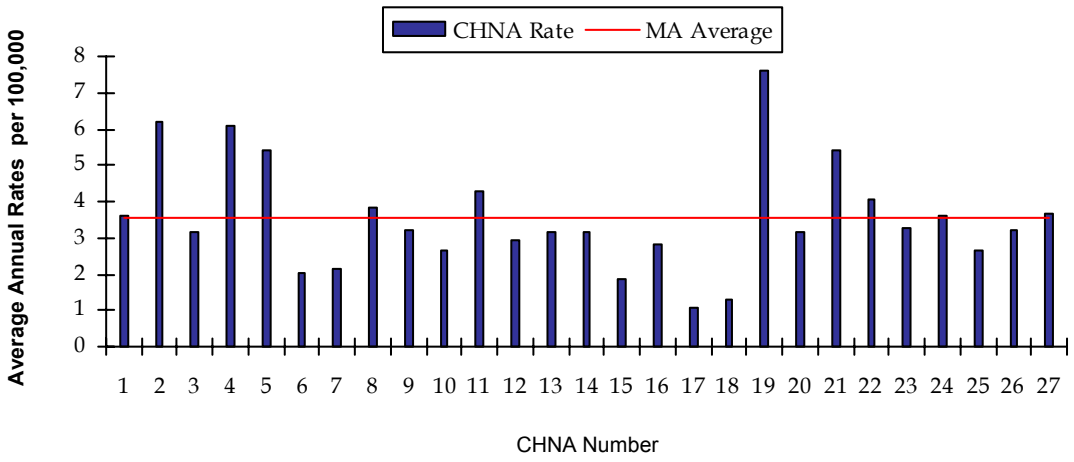
Findings

The maps show that the geographical regions with rates of firearm deaths substantially higher than the Massachusetts average (Figures 41 and 42) have the highest suicide (Figures 20 and 21) and homicide (Figures 24 and 25) rates. These regions include the areas of the Upper Valley Health Web (CHNA 2, the Franklin County area), the Community Health Connection (CHNA 4, the Springfield area), and the Alliance for Community Health (CHNA 19, the Boston area). Adjusting for age did not change the map. Although the overall Massachusetts firearm death rate was below the Healthy People 2010 Objective benchmark, these maps indicate areas which may benefit from more intensive injury prevention efforts.

Figure 30. Average Annual Crude Firearm Death Rates by CHNA of Residence, 1992-2001



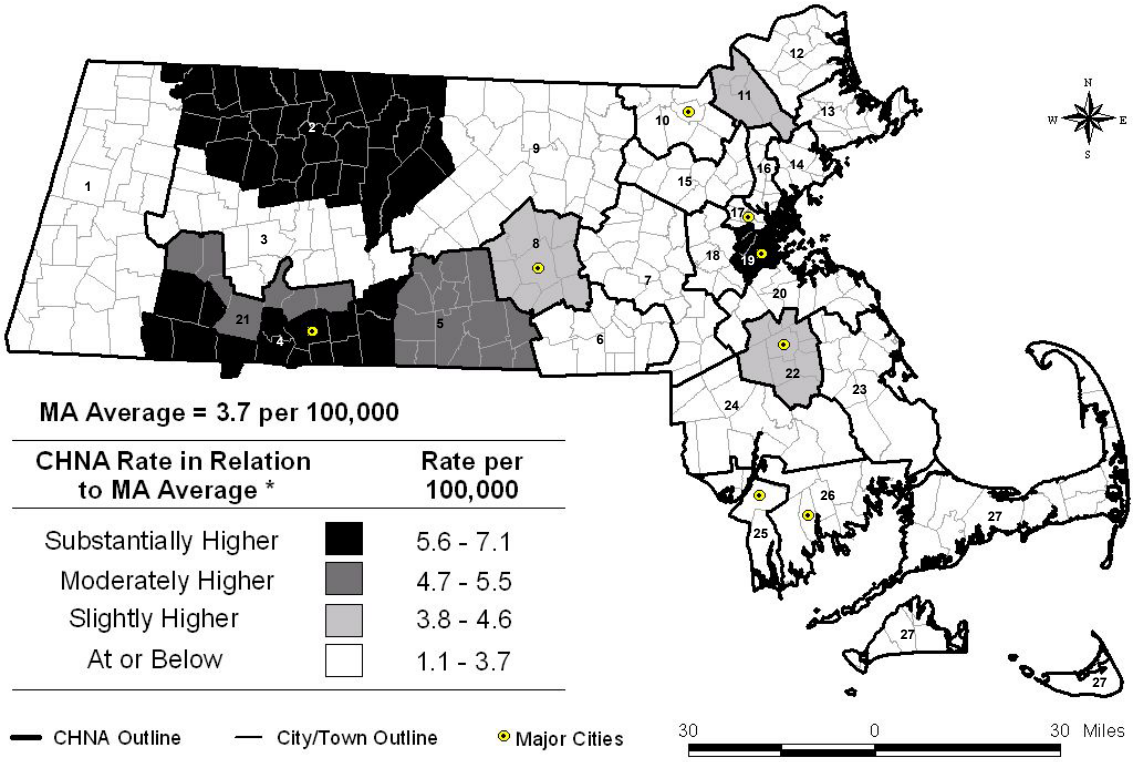
MA Average Number of Firearm Deaths = 237 per year



Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

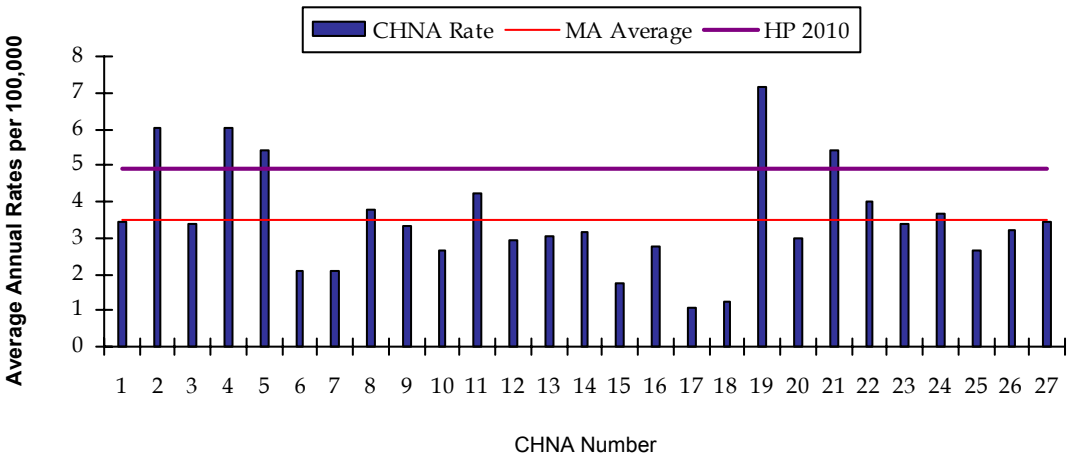
* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 31. Average Annual Age-Adjusted Firearm Death Rates by CHNA of Residence, 1992-2001



National Average Annual Age-Adjusted Rate = 12.4 per 100,000

Healthy People 2010 Objective = 4.9 per 100,000



Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

FALL INJURY

Background

Fall injuries result from slipping, tripping, stumbling, or jumping from one level to another or on the same level. They include but are not limited to work-related, sports-related, and self-inflicted events. Many falls occur within the home. Fall injuries may occur on stairs or steps, from ladders, out of buildings, and from playground and recreational equipment. They can result in hip fractures, traumatic brain injuries, and other diagnoses.

Deaths

In Massachusetts, from 1992 through 2001, there were 2,165 fall-related deaths, for an average of 217 deaths per year and an average annual crude rate of 3.4 deaths per 100,000. The average annual age-adjusted rate in Massachusetts was 3.4 deaths per 100,000. In comparison, the U.S. average annual age-adjusted rate was 4.6 deaths per 100,000. Both the Massachusetts and the U.S. average annual age-adjusted rates were higher than the Healthy People 2010 Objective benchmark of 2.3 deaths per 100,000. Fall injuries were the fifth leading cause of injury death in Massachusetts for 1992-2001. Sixty-five percent of these fall fatalities were among residents 65 years of age and older.

Hospitalizations

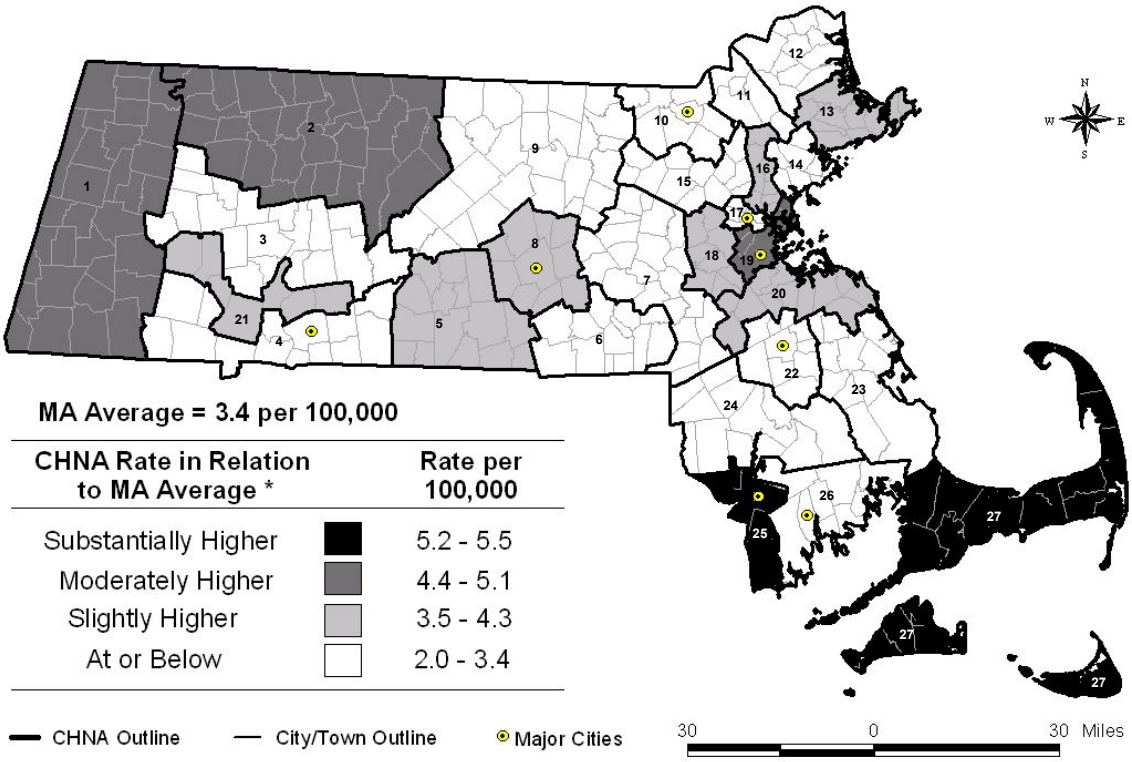
From 1998 through 2002, there were 116,651 fall-related hospitalizations, for an average of 23,330 hospitalizations per year and an average annual crude rate of 366.8 hospitalizations per 100,000. The average annual age-adjusted rate in Massachusetts was 364.9 hospitalizations per 100,000. Fall injuries were the overwhelming cause of injury hospitalizations (47%) in Massachusetts for 1998-2002, with the majority of fall hospitalizations being due to a fall on the same level such as the sidewalk or level floor.

Findings

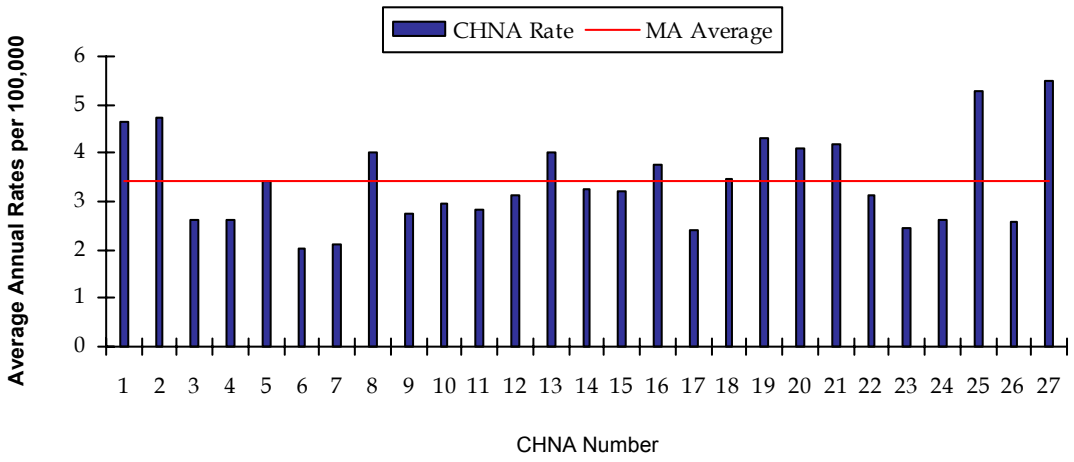
The maps show that geographic regions with crude fall death rates substantially higher than the Massachusetts average (Figure 32) also have high populations of residents aged 65 and older (Figure 1). These regions include the areas of the Partners for Healthier Communities (CHNA 25, the Fall River area) and the Cape Cod and Islands Community Health Network (CHNA 27). Fall rates in these areas were lower after adjusting for age (Figures 33 and 35), indicating age is a strong risk factor for fall-related deaths. Moderately higher rates are seen in the areas of the Community Health Network of Berkshire (CHNA 1) and the Alliance for Community Health (CHNA 19, the Boston area). Crude fall-related hospitalization rates were moderately higher than the Massachusetts average in the geographic areas of the Community Health

Network of Berkshire (CHNA 1), the Blue Hills Community Health Alliance (CHNA 20), the Partners for Healthier Communities (CHNA 25, the Fall River area), and the Cape Cod and Islands Community Health Network (CHNA 27). After adjusting for age, these areas became slightly higher than average.

Figure 32. Average Annual Crude Fall Death Rates by CHNA of Residence, 1992-2001



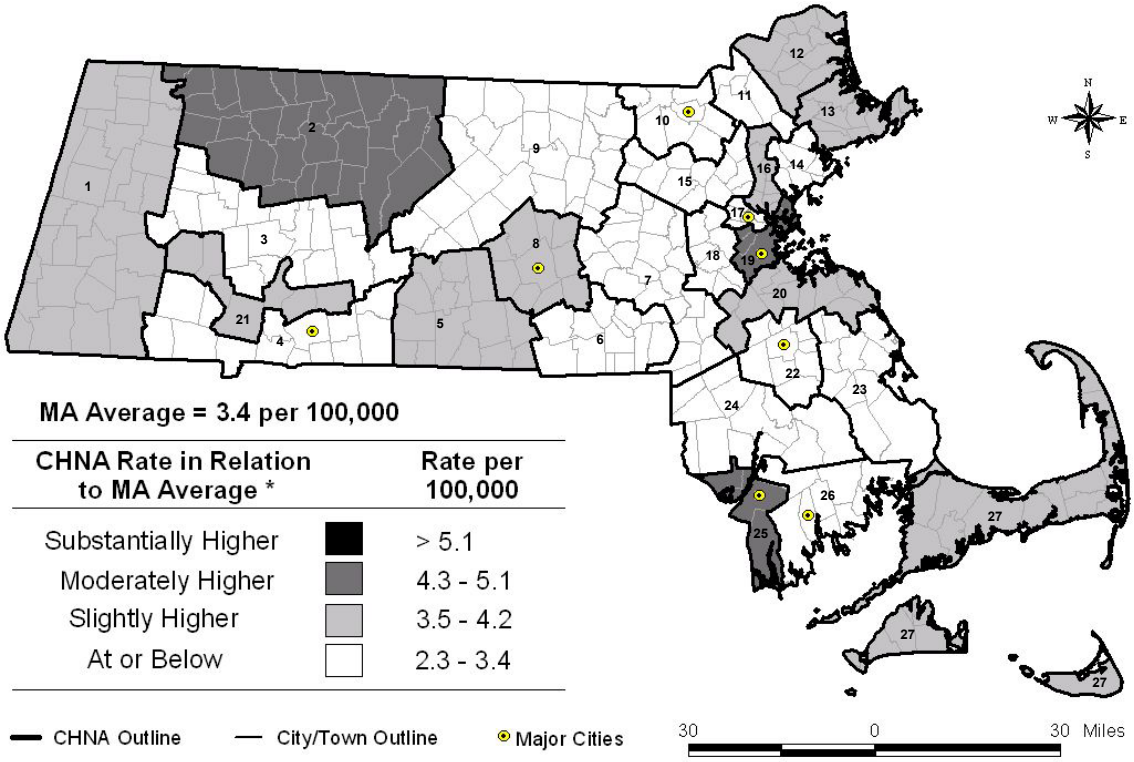
MA Average Number of Fall Deaths = 217 per year



Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

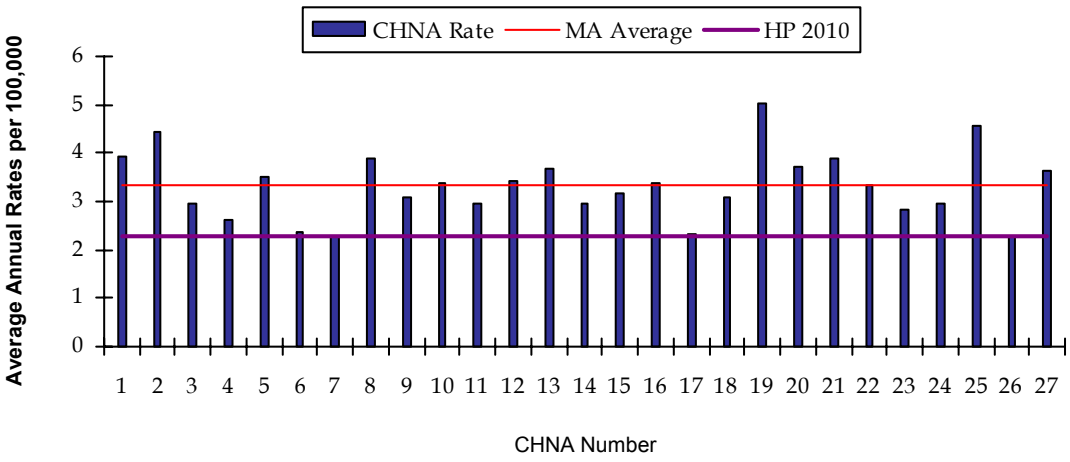
* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 33. Average Annual Age-Adjusted Fall Death Rates by CHNA of Residence, 1992-2001



U.S. Average Annual Age-Adjusted Rate = 4.6 per 100,000

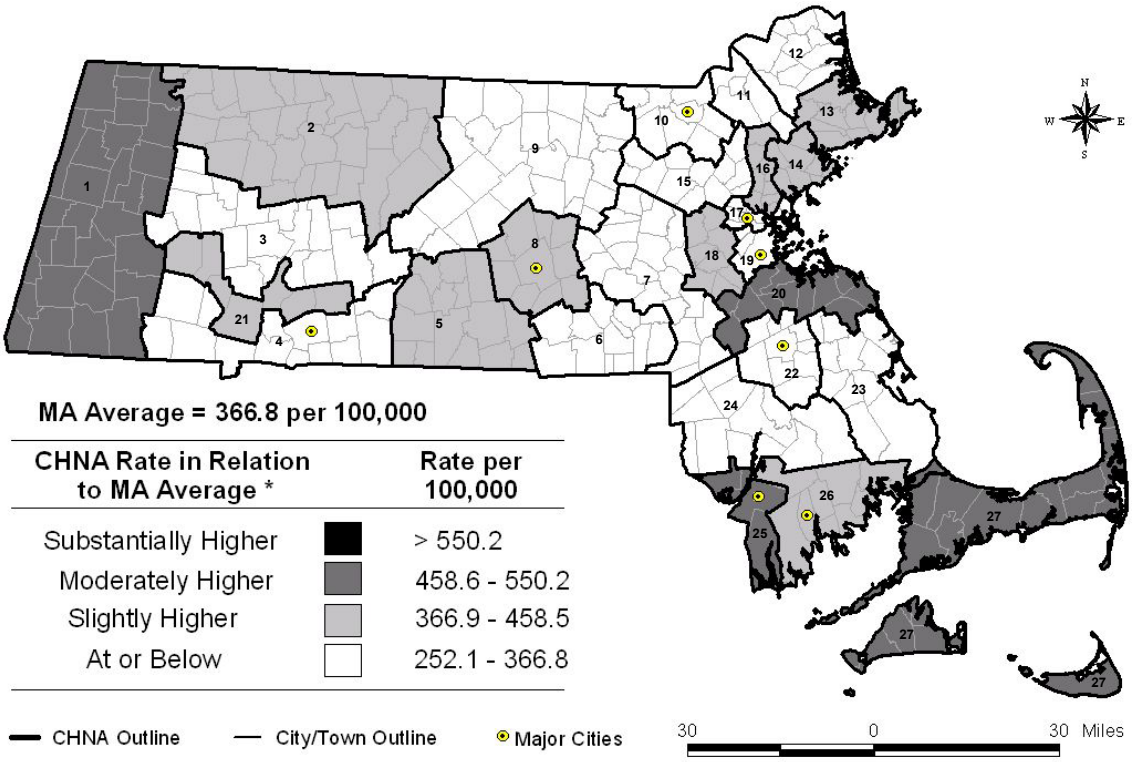
Healthy People 2010 Objective = 2.3 per 100,000



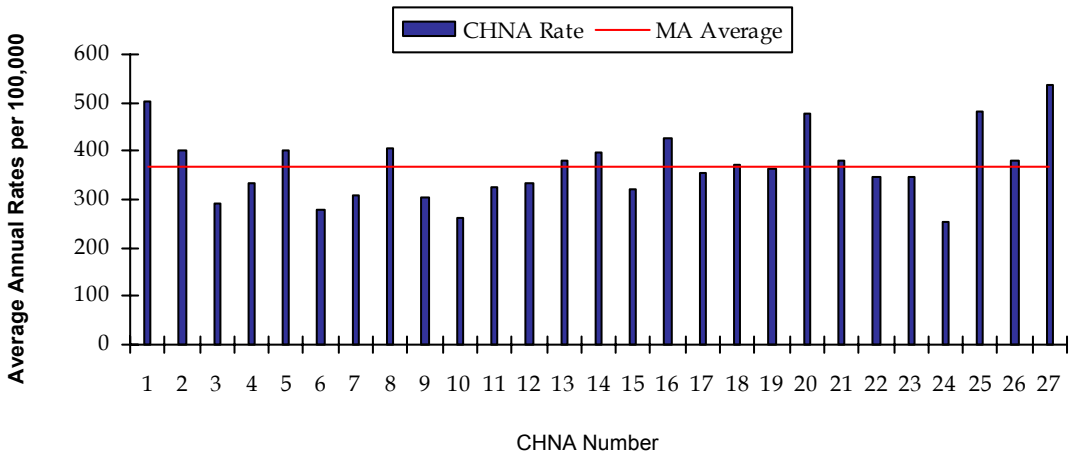
Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 34. Average Annual Crude Fall Hospitalization Rates by CHNA of Residence, FY1998-2002



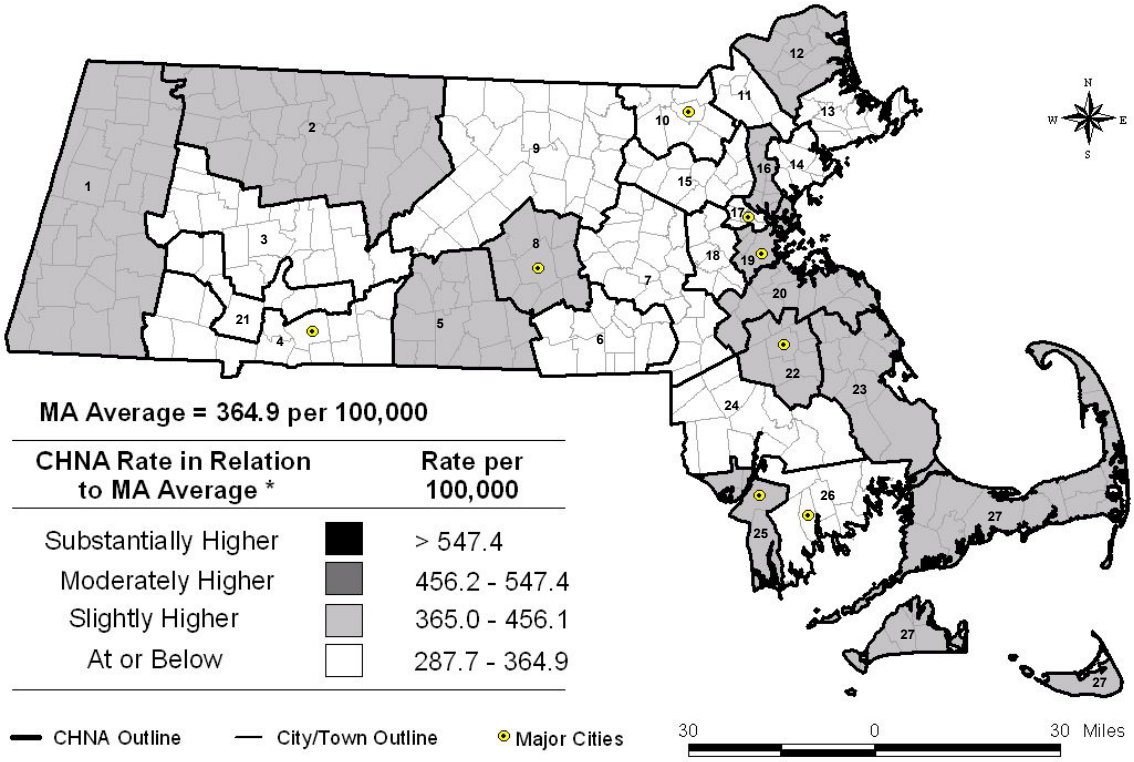
MA Average Number of Fall Hospitalizations = 23,330 per year

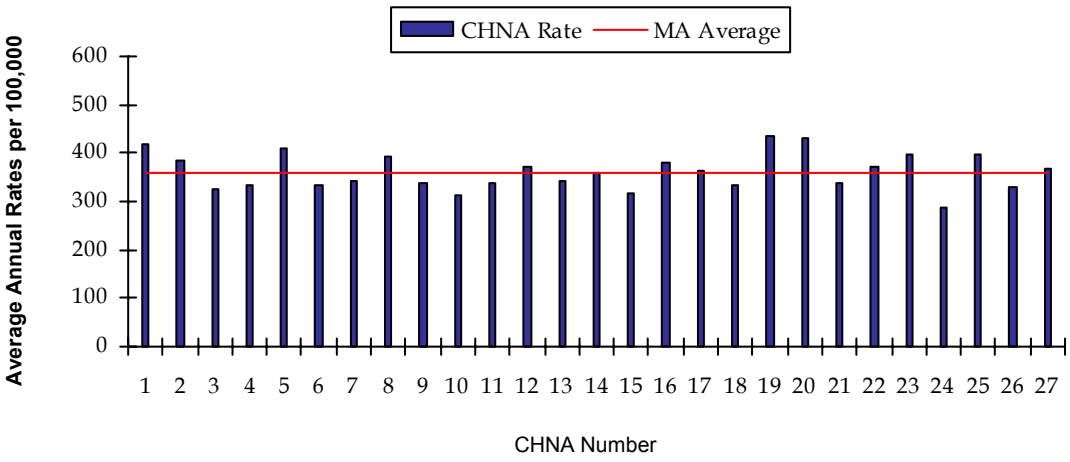


Data Sources: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 35. Average Annual Age-Adjusted Fall Hospitalization Rates by CHNA of Residence, FY1998-2002





Data Sources: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

POISONINGS

Background

Poisonings result from ingestion, inhalation, or other exposure to drugs, alcohol, and chemicals including solid/liquid substances, gases, and vapors causing damaging physiologic effects. The drugs that may be involved in poisoning include but are not limited to illicit drugs such as heroin and cocaine, prescription drugs such as antidepressants and sedatives, and over-the-counter drugs such as aspirin. Common household poisons including pesticides, detergents, cleaning products, and carbon monoxide may also cause poison-related injuries.

Deaths

In Massachusetts, from 1992 through 2001, there were 5,269 poisoning deaths, for an average of 527 deaths per year and an average annual crude rate of 8.3 deaths per 100,000. The average annual age-adjusted rate in Massachusetts was 8.0 deaths per 100,000. In comparison, the U.S. average annual age-adjusted rate was 6.6 deaths per 100,000. Both the Massachusetts and the U.S. average annual age-adjusted rates were higher than the Healthy People 2010 Objective benchmark of 1.8 deaths per 100,000. Poisonings were the leading cause of injury deaths in Massachusetts for 1992-2001. Fifty percent of these deaths were associated with an opioid (e.g. heroin, codeine, OxyContin®, etc.).

Hospitalizations

From 1998 through 2002, there were 23,133 poisoning-related hospitalizations, for an average of 4,627 hospitalizations per year and an average annual crude rate of 72.7 hospitalizations per 100,000. The average annual age-adjusted rate was 71.7 hospitalizations per 100,000. Poisonings were tied with Motor Vehicle Traffic as the second leading cause of injury hospitalizations and the leading cause of hospitalizations for self-inflicted injuries in Massachusetts for 1998-2002.

Findings

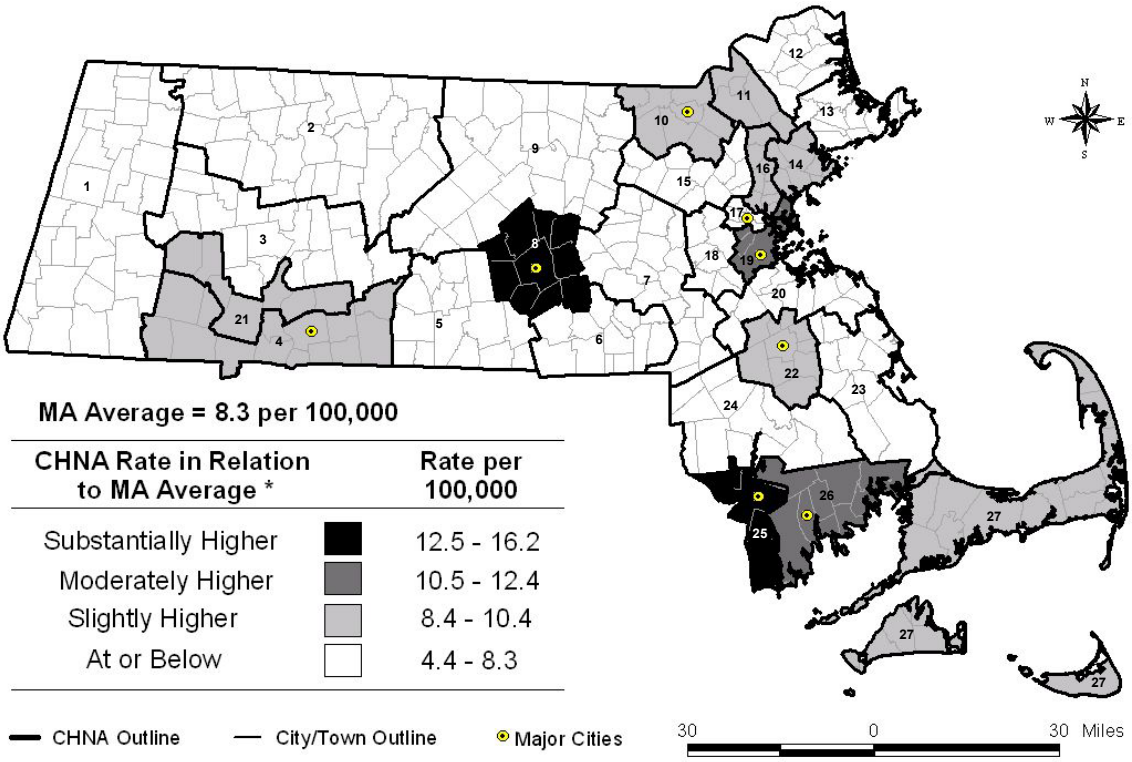
The maps show that geographic regions with poison death rates substantially and moderately higher than the Massachusetts average (Figures 36 and 37) have high rates of undetermined deaths (Figures 28 and 29). These regions include the areas of the Common Pathways (CHNA 8, the greater Worcester area), the Alliance for Community Health (CHNA 19, the Boston area), the Partners for Healthier Communities (CHNA 25, the Fall River area), and the Greater New Bedford Community Health Network (CHNA 26). Adjusting for age made little difference in the map.

Geographic regions with poison hospitalization rates moderately higher than the Massachusetts average (Figures 38 and 39) have high rates of hospitalizations for self-inflicted injury (Figures 22 and 23). These regions

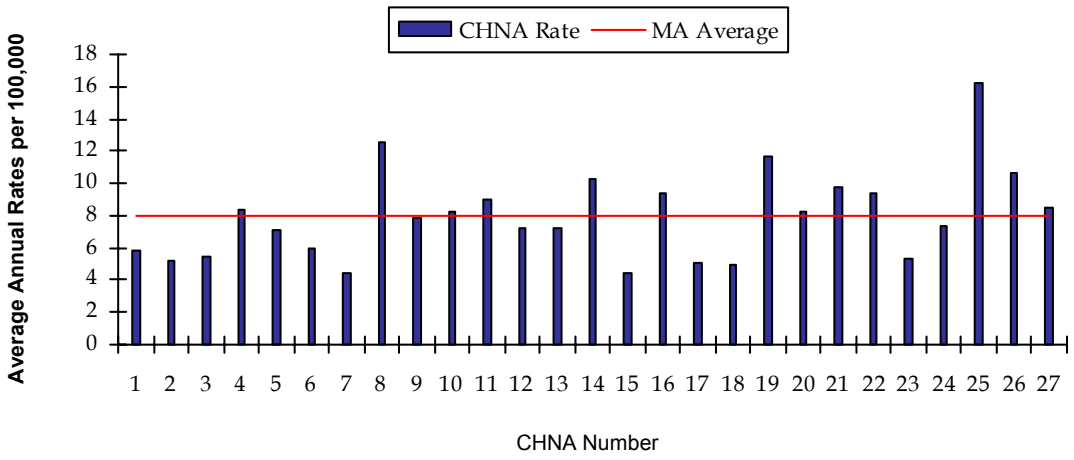
include the areas of the Upper Valley Health Web (CHNA 2, Franklin County area), the Community Health Connection (CHNA 4, the Springfield area), the North Shore Community Health Network (CHNA 14), the Community Health Network of Chicopee-Holyoke-Ludlow-Westfield (CHNA 21), and the Greater Brockton Community Network (CHNA 22). In fact, 59% of all poisonings resulting in hospitalization in Massachusetts during FY1998-2002 were self-inflicted.

It should also be noted that although poisoning death rates in the area of the Greater Cambridge/Somerville Community Health Network (CHNA 17) are not high in relation to the Massachusetts average, poisonings are still an important health concern within that area. Poisoning deaths represent 24% of the total injury deaths in the area of the Greater Cambridge/Somerville CHNA, which has one of the lowest poisoning death rates in Massachusetts, and the neighboring area of the Alliance for Community Health (CHNA 19, the Boston area), which has one of the highest rates.

Figure 36. Average Annual Crude Poisoning Death Rates by CHNA of Residence, 1992-2001



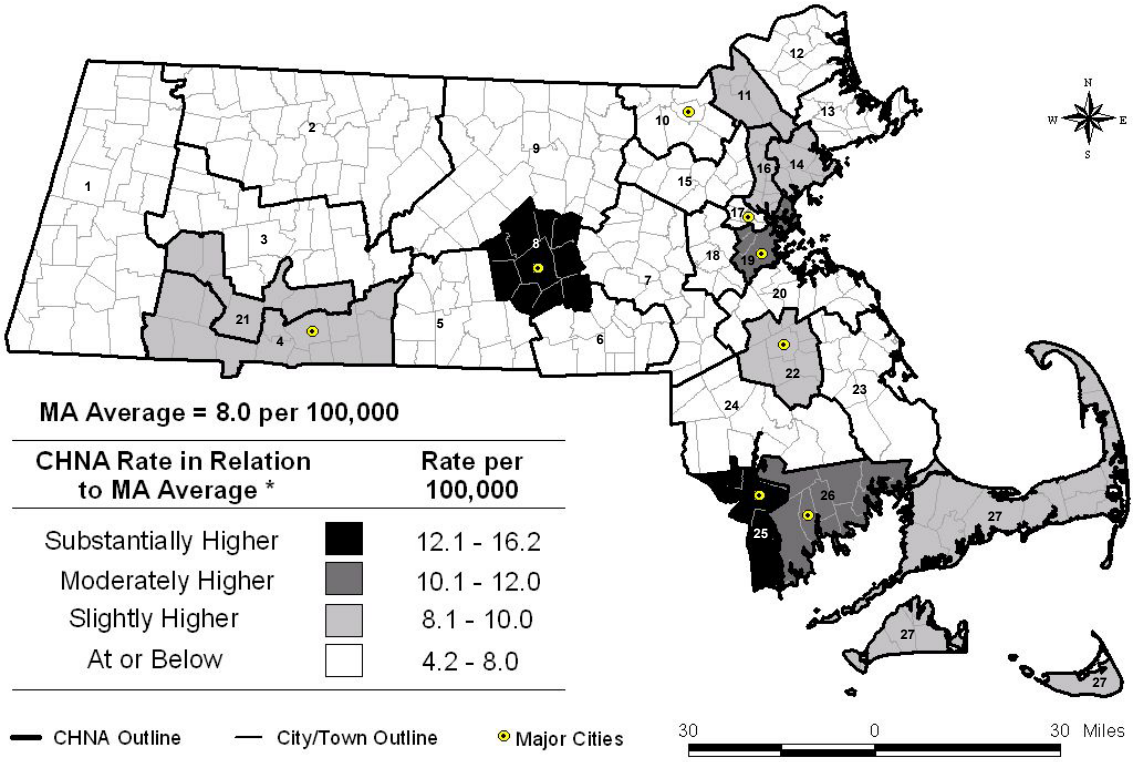
MA Average Number of Poisoning Deaths = 527 per year



Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health;
Massachusetts Executive Office of Environmental Affairs, MassGIS.

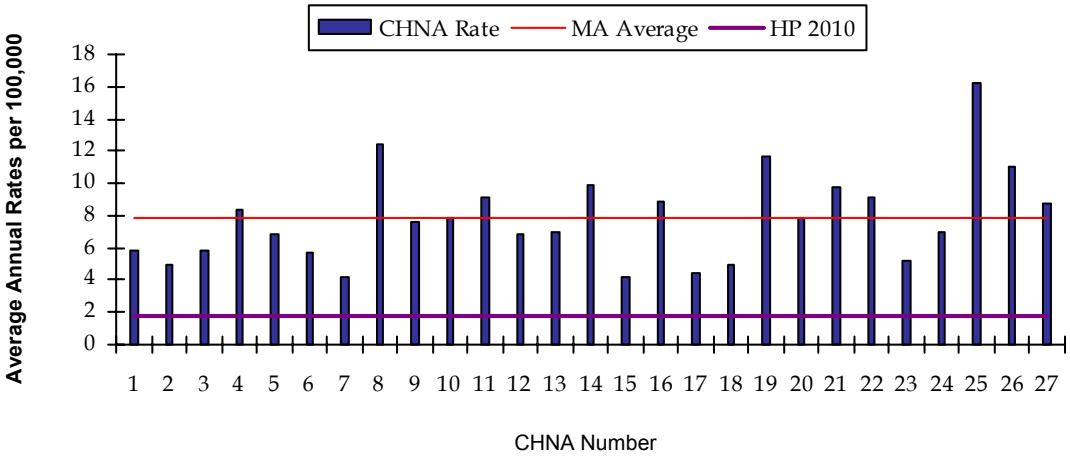
* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 37. Average Annual Age-Adjusted Poisoning Death Rates by CHNA of Residence, 1992-2001



U.S. Average Annual Age-Adjusted Rate = 6.6 per 100,000

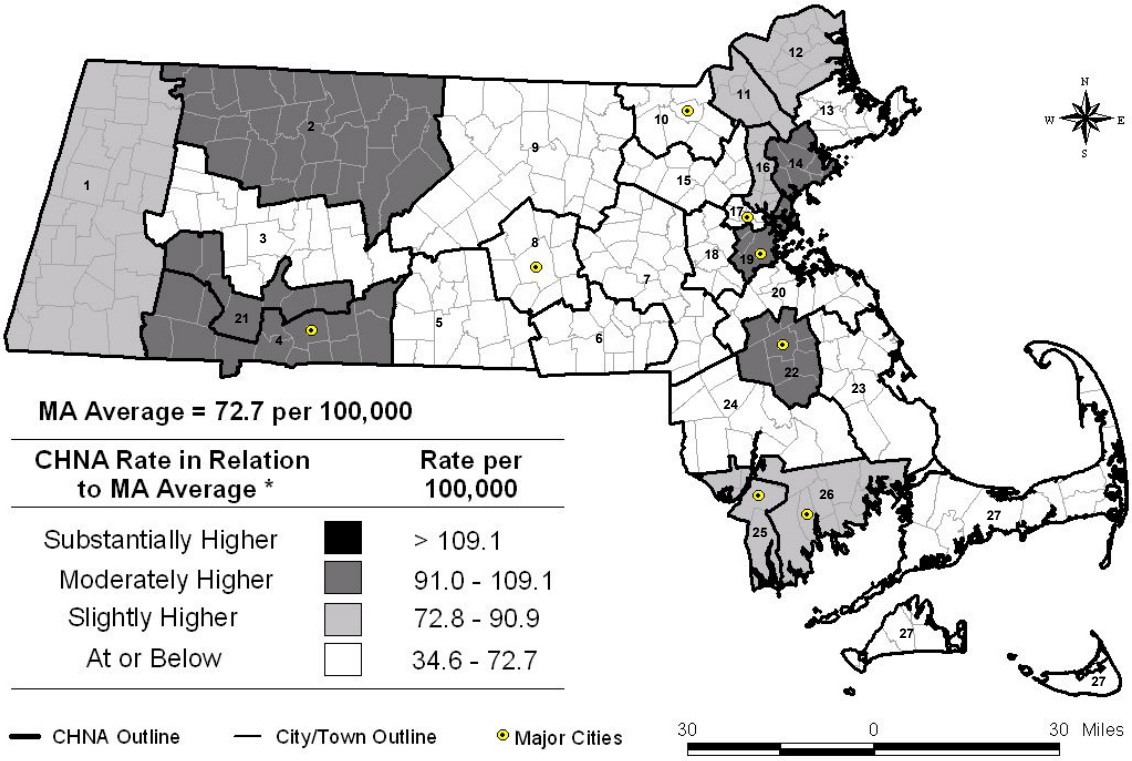
Healthy People 2010 Objective = 1.8 per 100,000



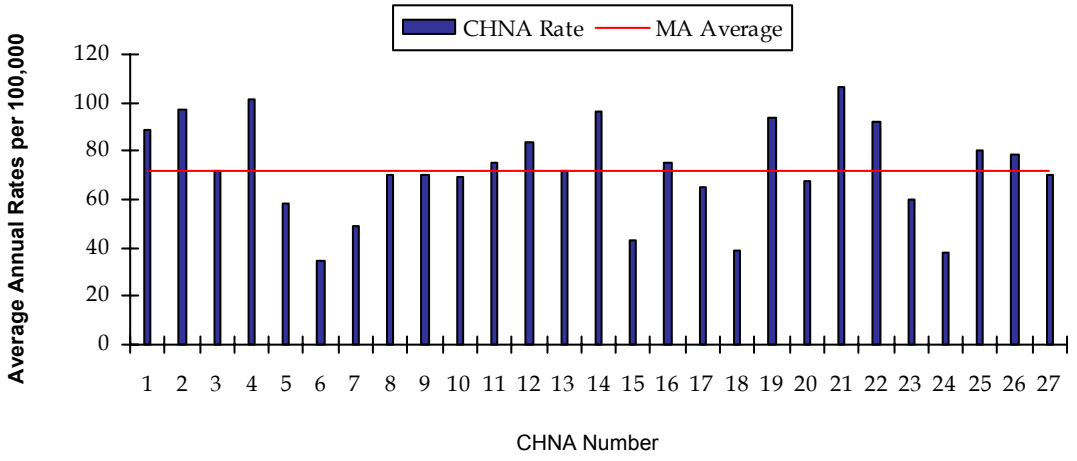
Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 38. Average Annual Crude Poisoning Hospitalization Rates by CHNA of Residence, FY1998-2002



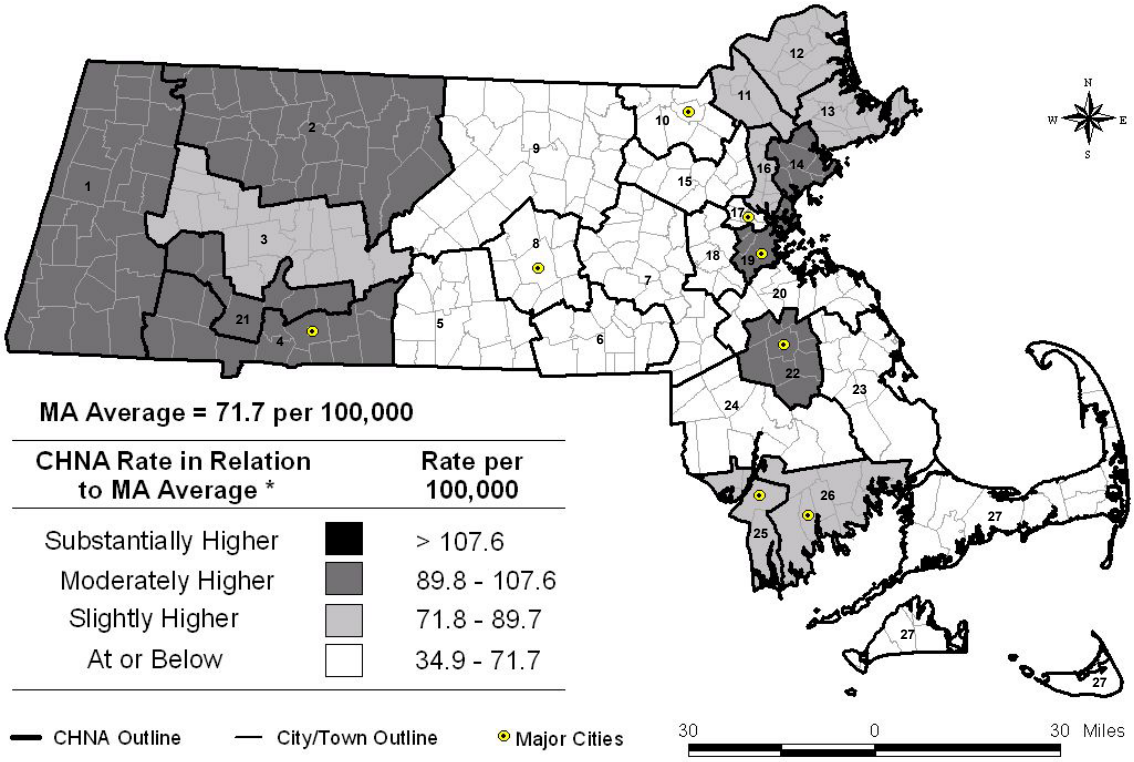
MA Average Number of Poisoning Hospitalizations = 4,627 per year

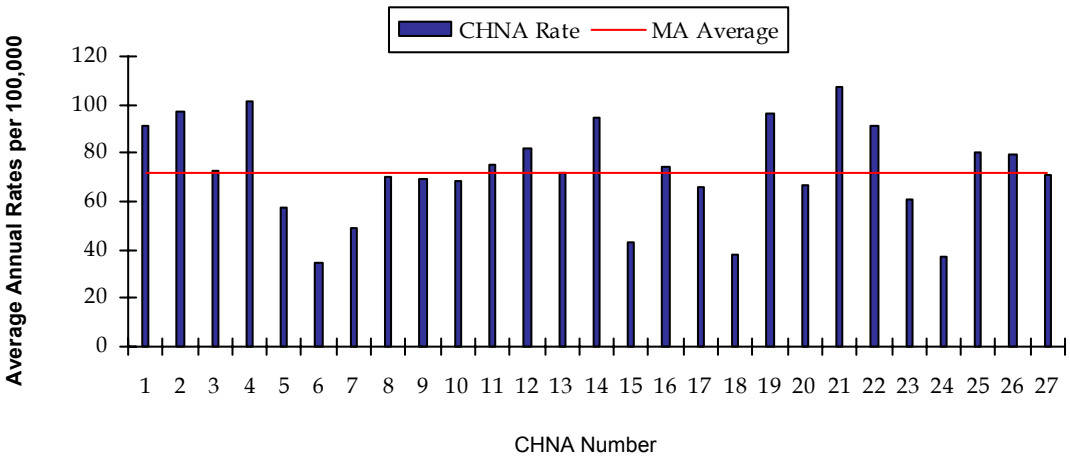


Data Sources: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 39. Average Annual Age-Adjusted Poisoning Hospitalization Rates by CHNA of Residence, FY1998-2002





Data Sources: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

MOTOR VEHICLE TRAFFIC INJURY

Background

Motor vehicle traffic (MVT) injuries may involve automobiles, vans, trucks, motorcycles, trains, or trams. These injuries include incidents occurring on public highways and roadways, but not in private driveways. Among those injured in these occurrences may be drivers, passengers, motorcyclists, pedestrians, or pedal-cyclists.

Deaths

In Massachusetts, from 1992 through 2001, there were 4,893 motor vehicle traffic deaths, for an average of 489 deaths per year and an average annual crude rate of 7.7 deaths per 100,000. The average annual age-adjusted rate in Massachusetts was 7.6 deaths per 100,000. In comparison, the U.S. average annual age-adjusted rate was 15.4 deaths per 100,000. The Massachusetts average annual age-adjusted MVT death rate was also below the Healthy People 2010 Objective benchmark of 9.0 deaths per 100,000. Motor vehicle traffic deaths were the second leading cause of injury death and the leading cause of unintentional injury death in Massachusetts for 1992-2001.

Hospitalizations

From 1998 through 2002, there were 21,566 motor vehicle traffic-related hospitalizations, for an average of 4,313 hospitalizations per year and an average annual crude rate of 67.8 hospitalizations per 100,000. The average annual age-adjusted rate in Massachusetts was 67.6 hospitalizations per 100,000. MVT-related hospitalizations were tied with Poisonings as the second leading cause of injury hospitalizations in Massachusetts for 1998-2002.

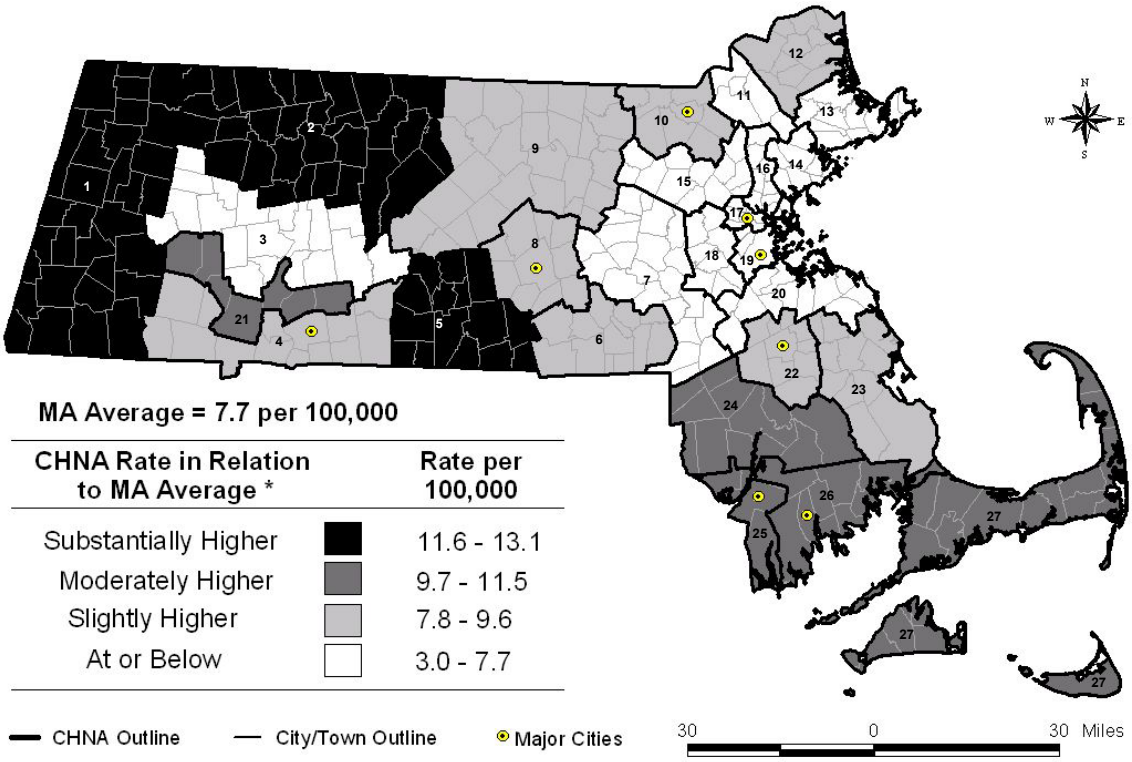
Findings

The maps show that geographic regions with rates of motor vehicle traffic-related deaths substantially higher than the Massachusetts average (Figures 40 and 41) have low population sizes (Figure 4) and low population densities (Figure 5).* These regions include the areas of the Community Health Network of Berkshire (CHNA 1), the Upper Valley Health Web (CHNA 2, the Franklin County area), and the Community Health Network of Southern Worcester County (CHNA 5). Residents of less populated areas may drive farther distances and spend more time driving than residents in more populated areas, resulting in higher rates of exposure to the possibility of a MVT injury. When interpreting these maps, it is important to keep in mind that the maps represent the geographical location of the injured person's residence, not necessarily the location where the injury occurred.

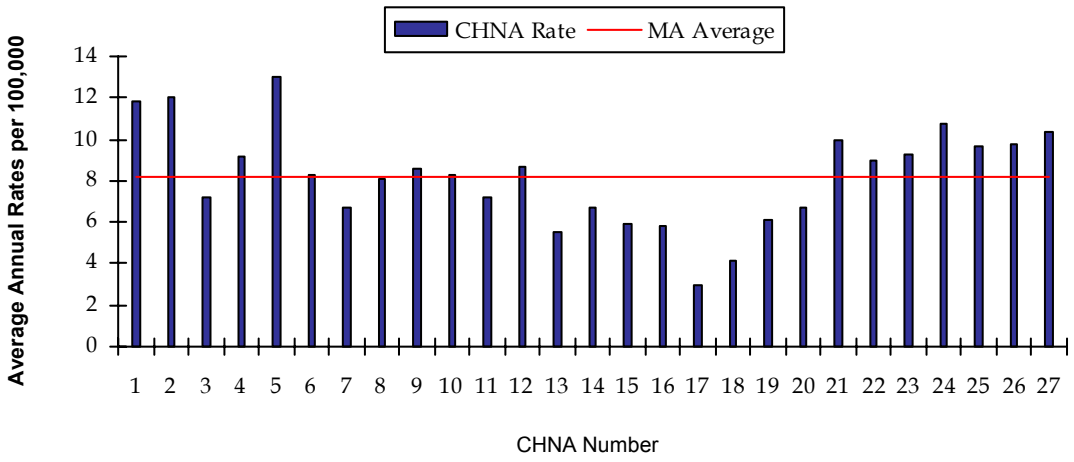
* Please refer to the Limitations section (page xi) for interpreting the MVT maps.

Crude MVT-related hospitalization rates were moderately higher in the geographical areas of the Upper Valley Health Web (CHNA 2, the Franklin County area), the Community Health Network of Southern Worcester County (CHNA 5), the Common Pathways (CHNA 8, the greater Worcester area), the Greater Brockton Community Health Network (CHNA 22), and the Cape Cod and Islands Community Health Network (CHNA 27). When rates were age-adjusted, the areas of the Community Health Connection (CHNA 4, the Springfield area) and the South Shore Community Health Network (CHNA 23) became moderately higher.

Figure 40. Average Annual Crude Motor Vehicle Traffic Death Rates by CHNA of Residence, 1992-2001



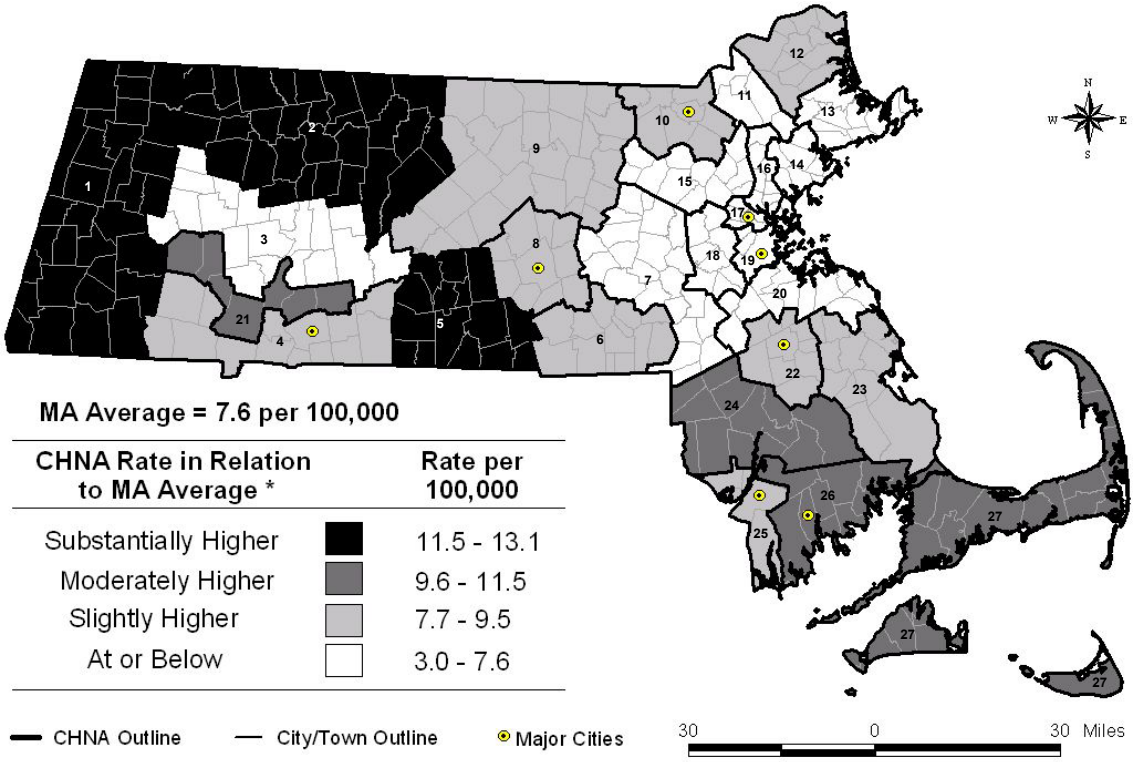
MA Average Number of Motor Vehicle Traffic Deaths = 489 per year



Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

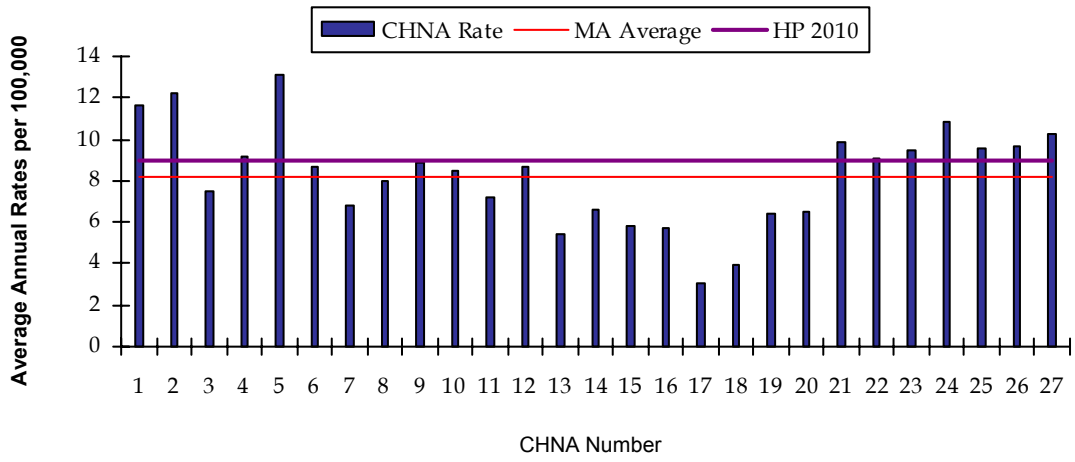
* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 41. Average Annual Age-Adjusted Motor Vehicle Traffic Death Rates by CHNA of Residence, 1992-2001



U.S. Average Annual Age-Adjusted Rate = 15.4 per 100,000

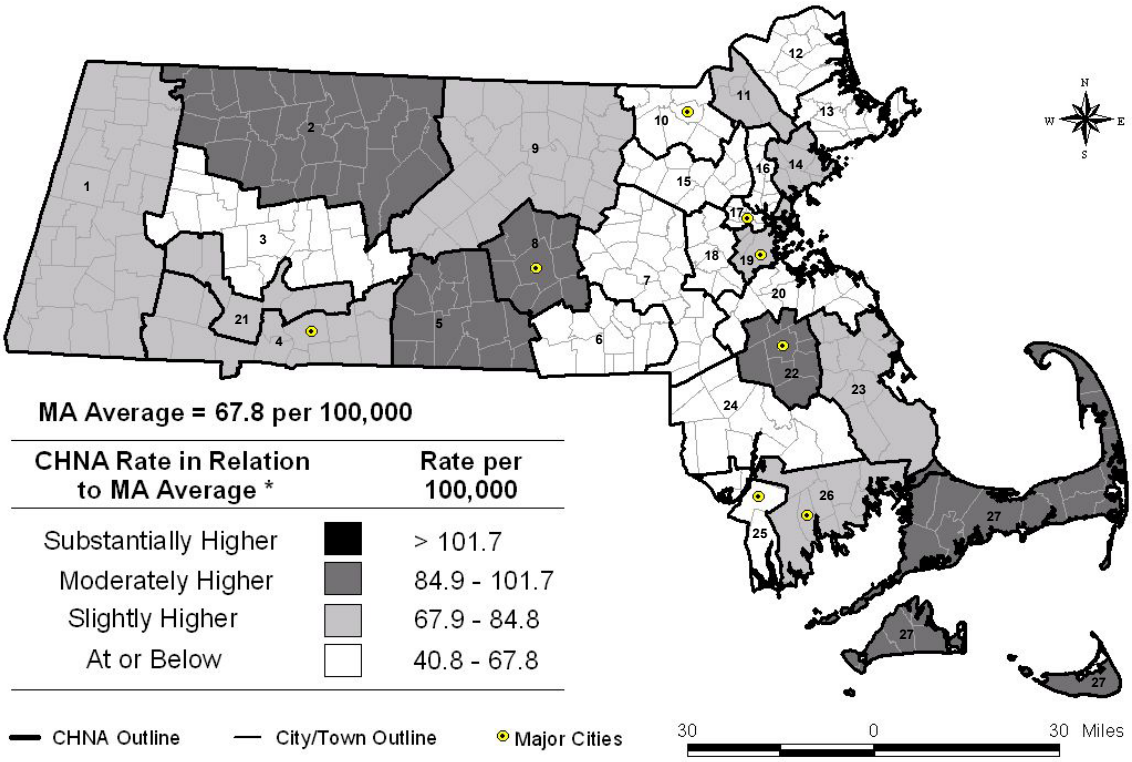
Healthy People 2010 Objective = 9.0 per 100,000



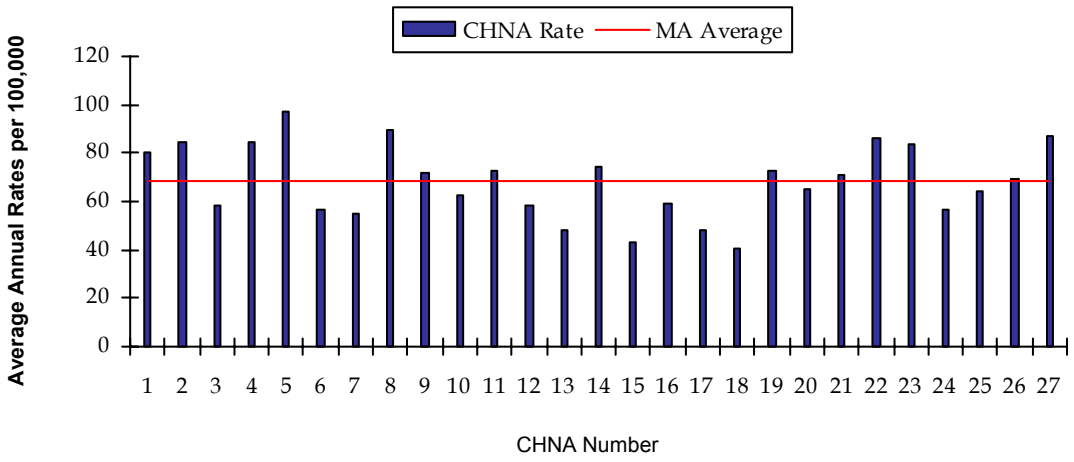
Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 42. Average Annual Crude Motor Vehicle Traffic Hospitalization Rates by CHNA of Residence, FY1998-2002



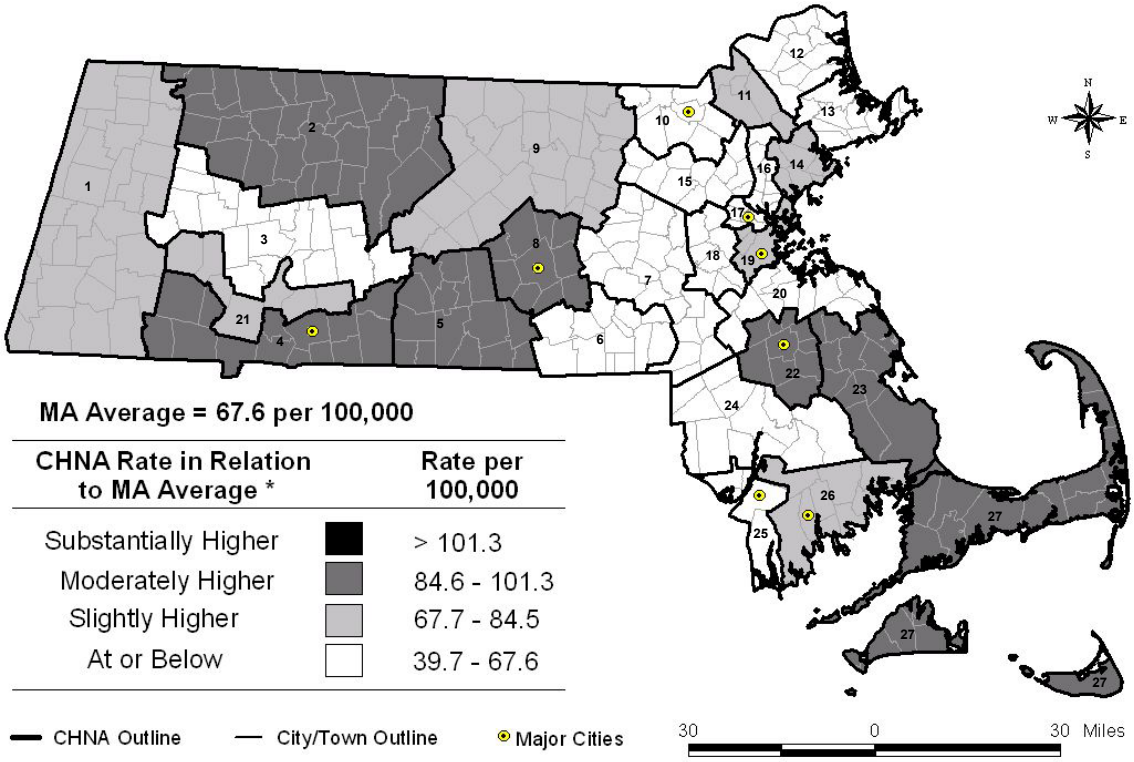
MA Average Number of Motor Vehicle Traffic Hospitalizations = 4,313 per year

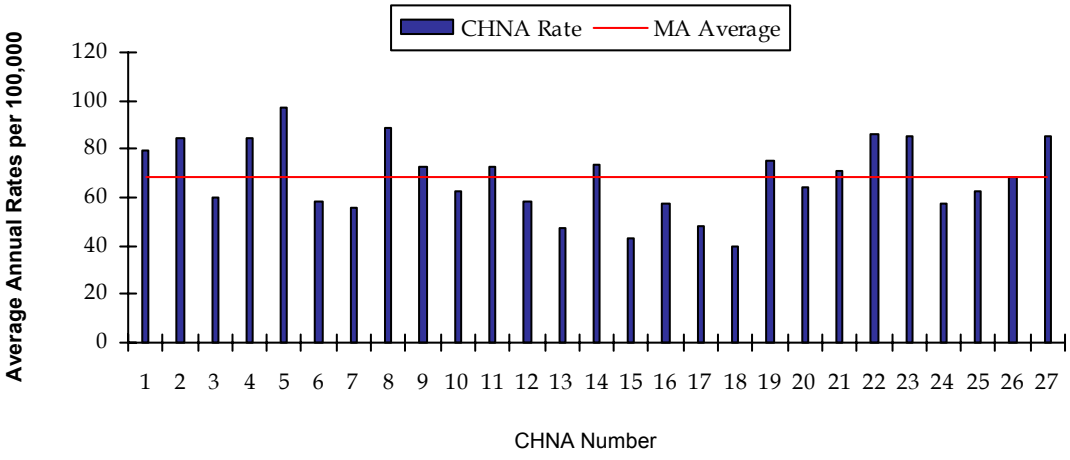


Data Sources: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 43. Average Annual Age-Adjusted Motor Vehicle Traffic Hospitalization Rates by CHNA of Residence, FY1998-2002





Data Sources: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

SUFFOCATION INJURY

Background

Suffocation results from inhalation or ingestion of food or other objects or by other mechanical means (e.g. plastic bag over face, entangled bedding, choking, hanging) that obstructs a person's airway. Suffocation is the third leading cause of injury death in Massachusetts. Fifty-seven percent of suffocation deaths in Massachusetts from 1992-2001 were suicides and 7% were due to choking on food. Elderly residents ages 65 and older have the highest rates of unintentional suffocation death and hospitalization.

Deaths

In Massachusetts, from 1992 through 2001, there were 2,741 suffocations, for an average of 274 deaths per year and an average annual crude rate of 4.3 deaths per 100,000. The average annual age-adjusted suffocation death rate in Massachusetts was 4.2 deaths per 100,000. In comparison, the U.S. average annual age-adjusted rate was 4.0 deaths per 100,000. Both the Massachusetts and the U.S. average annual age-adjusted rates were higher than the Healthy People 2010 Objective benchmark of 2.9 deaths per 100,000.

Hospitalizations

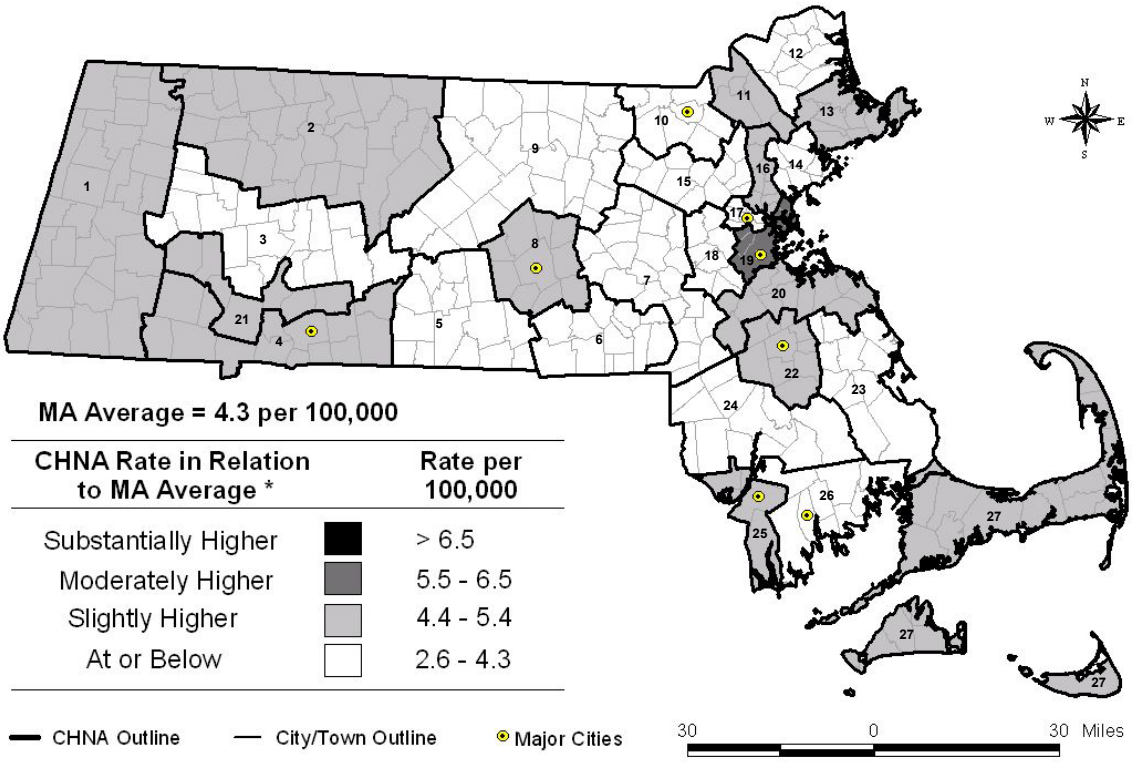
From 1998 through 2002, there were 1,544 suffocation-related hospitalizations, for an average of 309 hospitalizations per year and an average annual crude rate of 4.9 hospitalizations per 100,000. The average annual age-adjusted rate in Massachusetts was 4.8 hospitalizations per 100,000. Because of the lethal nature of this injury, the numbers of non-fatal suffocation injuries were lower than injuries from other causes. Therefore, hospitalization rates for suffocation injuries are not mapped.

Findings

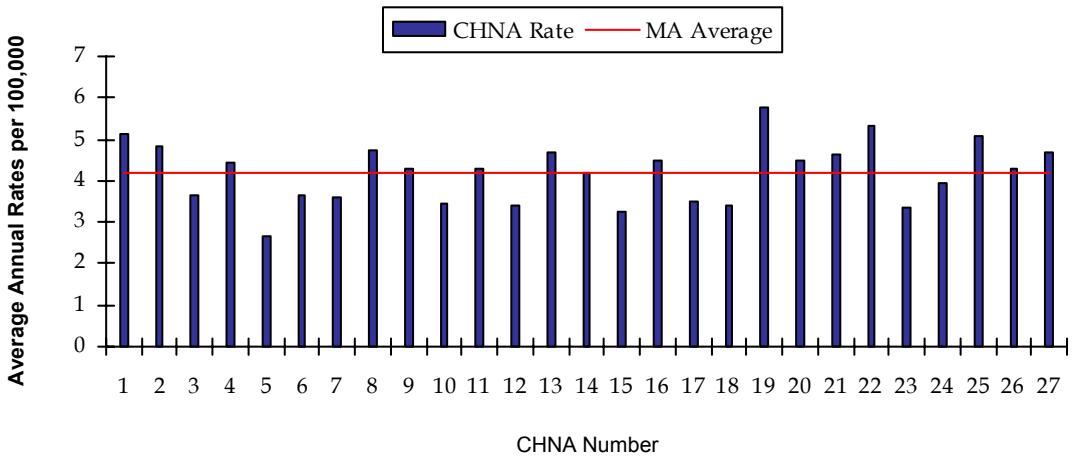
The maps show that the geographical area of the Alliance for Community Health (CHNA 19, the Boston area), which has the highest suffocation death rates (Figures 44 and 45), has one of the highest suicide rates (Figures 20 and 21). In Massachusetts, suffocation deaths were the leading cause of suicides for 1992-2001. This differs from national data wherein firearms were the leading cause of suicide.

Except for the area of CHNA 19, which has a suffocation death rate moderately higher than the Massachusetts average, the geographical areas have rates that are either slightly higher, at, or below the Massachusetts rate. However, only the area of the Community Health Network of Southern Worcester (CHNA 5) has a rate which is below the Healthy People 2010 Objective benchmark.

Figure 44. Average Annual Crude Suffocation Rates by CHNA of Residence, 1992-2001



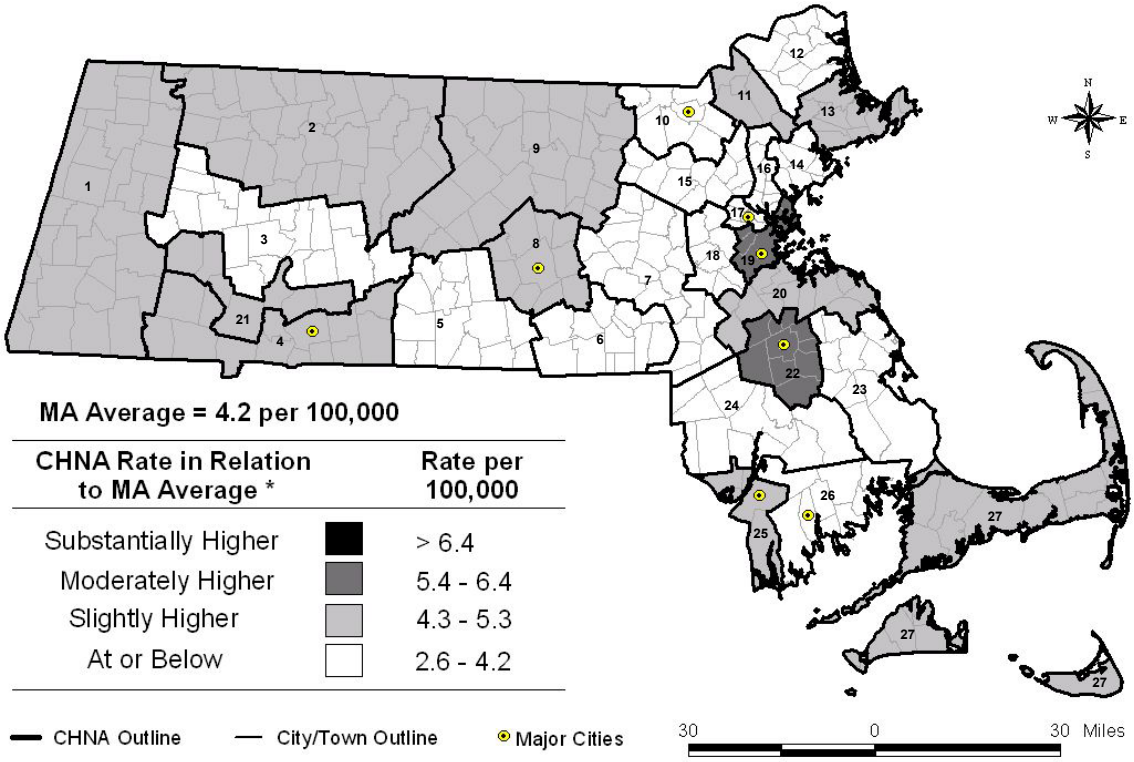
MA Average Number of Suffocation Deaths = 274 per year



Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health;
Massachusetts Executive Office of Environmental Affairs, MassGIS.

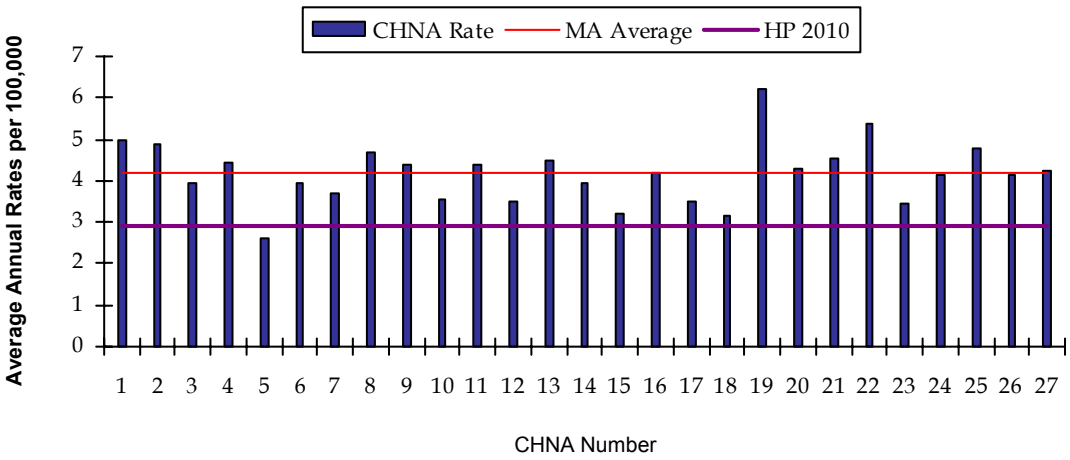
* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 45. Average Annual Age-Adjusted Suffocation Rates by CHNA of Residence, 1992-2001



U.S. Average Annual Age-Adjusted Rate = 4.0 per 100,000

Healthy People 2010 Objective = 2.9 per 100,000



Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

TRAUMATIC BRAIN INJURY

Background

A traumatic brain injury (TBI) is one of the most serious injuries. A TBI is defined as an occurrence of injury to the head (arising from blunt or penetrating trauma or from acceleration-deceleration forces) that is associated with any of these symptoms or signs attributable to the injury: decreased level of consciousness, amnesia, other neurologic or neuropsychologic abnormalities, skull fracture, diagnosed intracranial lesions, or death. Unlike the other injuries which have been presented in the Atlas up to this point, traumatic brain injury represents a diagnostic condition. These injuries can be due to many different causes, including causes described in other sections. The numbers and rates presented here reflect TBIs due to all causes and intents.

Deaths

In Massachusetts, from 1992 through 2001, there were 5,530 TBI deaths, for an average of 553 deaths per year and an average annual crude rate of 8.7 deaths per 100,000. The average annual age-adjusted TBI death rate in Massachusetts was 8.6 deaths per 100,000. In comparison, the U.S. average annual age-adjusted TBI rate was 19.4 deaths per 100,000. The three leading causes of TBI deaths were falls, firearms, and motor vehicle-related injuries.

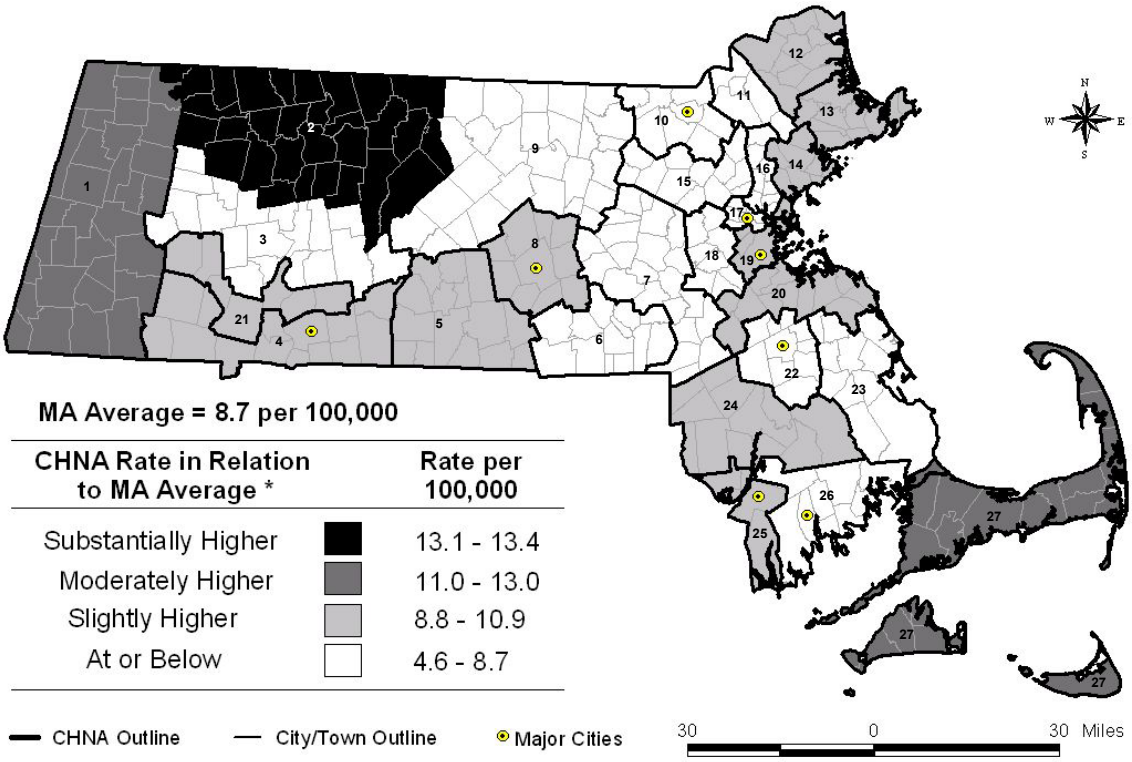
Hospitalizations

From 1998 through 2002, there were 19,865 TBI-related hospitalizations, for an average of 3,973 hospitalizations per year and an average annual crude rate of 62.5 hospitalizations per 100,000. The average annual age-adjusted rate was 62.5 hospitalizations per 100,000. The three leading causes of TBI hospitalizations were injuries related to a fall, motor vehicle traffic, and being struck by or against an object or person.

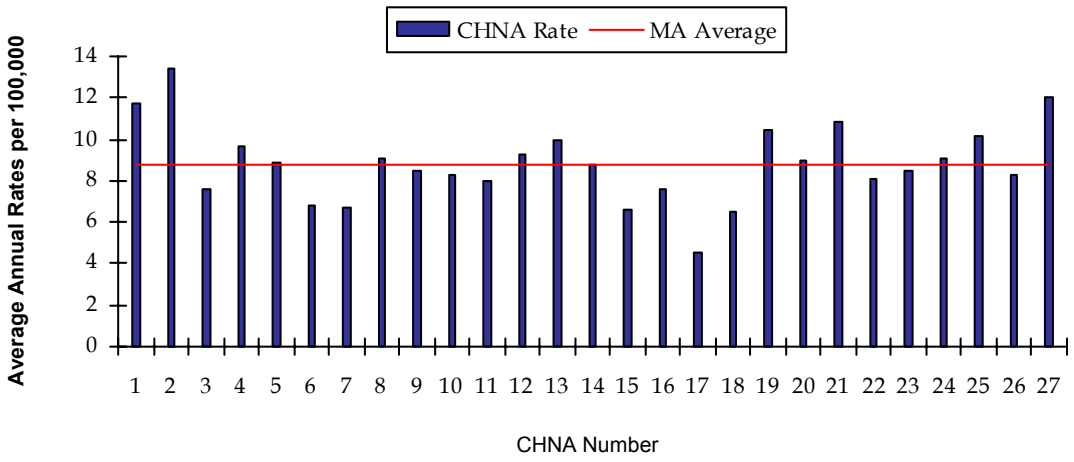
Findings

The geographical area of the Upper Valley Health Web (CHNA 2, the Franklin County area), which has one of the highest fall death rates (Figures 32 and 33), motor vehicle traffic death rates (Figures 40 and 41), and firearm death rates (Figures 30 and 31), has the highest TBI death rate in Massachusetts (Figures 46 and 47). Many of the areas with elevated TBI-related hospitalization rates (Figures 48 and 49) are the same areas with elevated motor vehicle-related hospitalization rates (Figures 42 and 43) and fall-related hospitalization rates (Figures 34 and 35).

Figure 46. Average Annual Crude Traumatic Brain Injury Death Rates by CHNA of Residence, 1992-2001



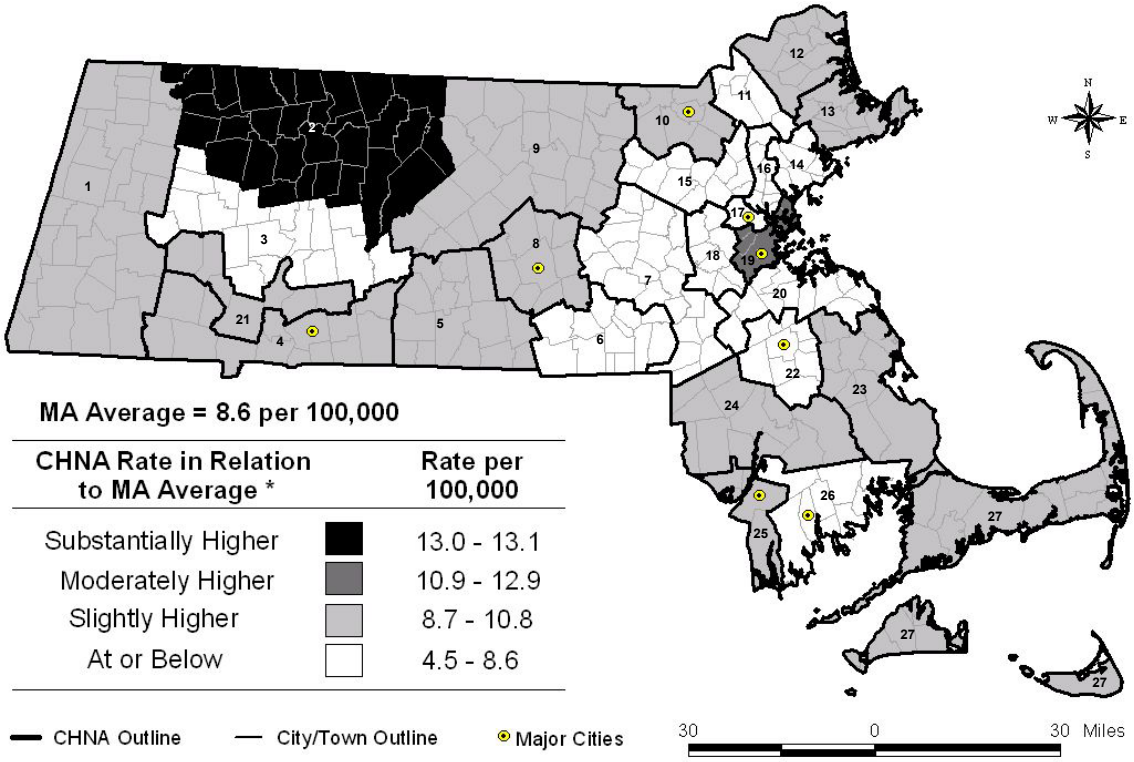
MA Average Number of Traumatic Brain Injury Deaths = 553 per year



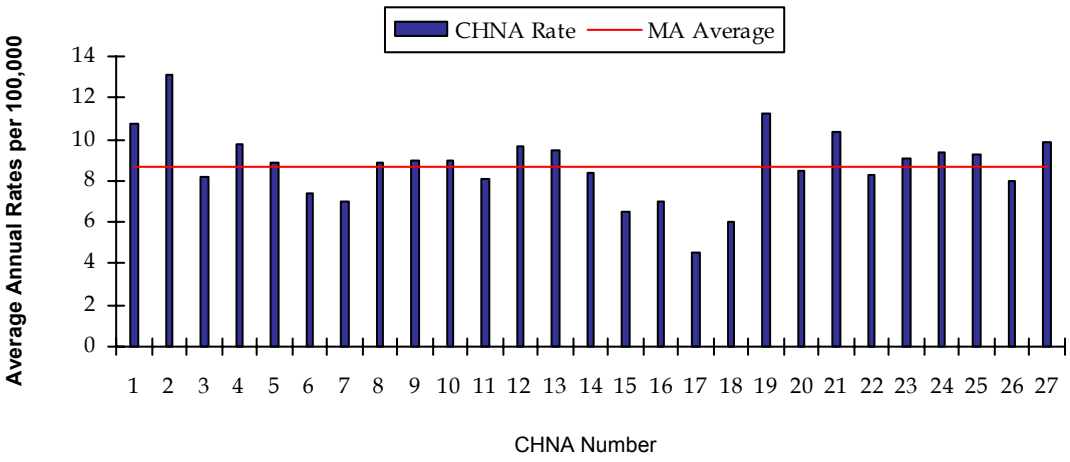
Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health;
Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 47. Average Annual Age-Adjusted Traumatic Brain Injury Death Rates by CHNA of Residence, 1992-2001



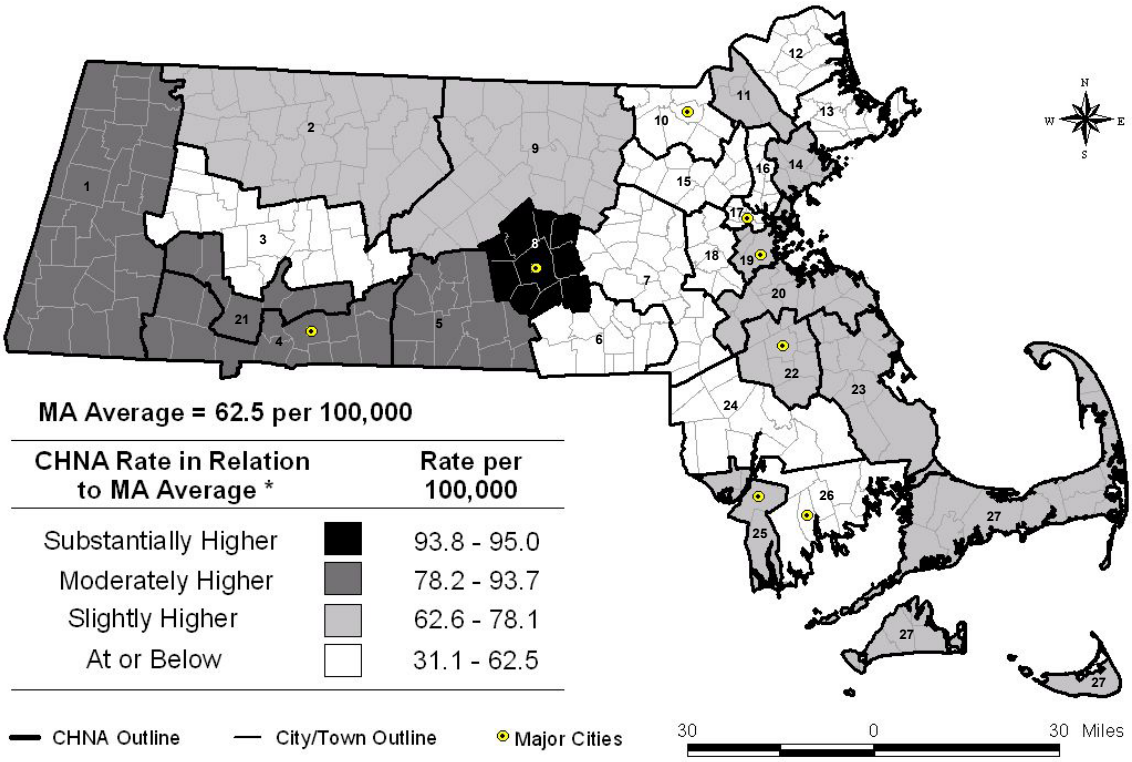
U.S. Average Annual Age-Adjusted Rate = 19.4 per 100,000



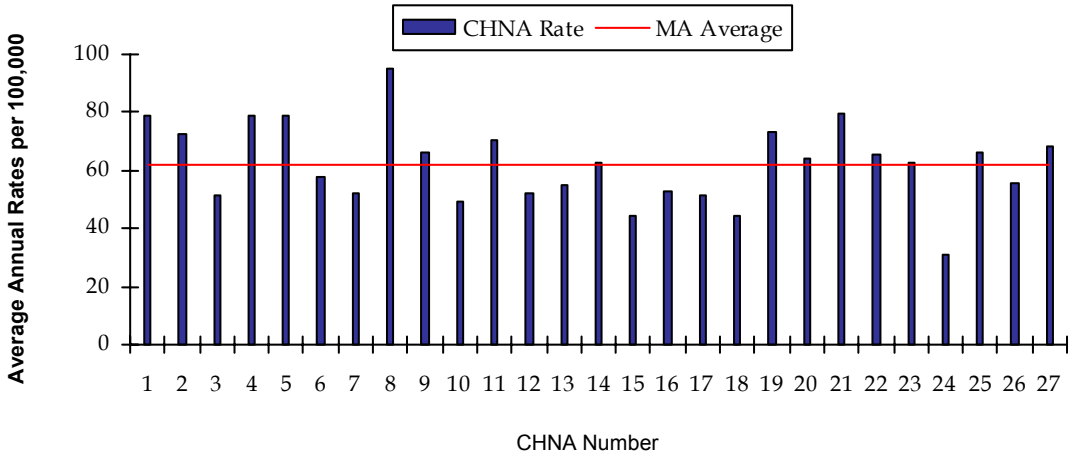
Data Sources: Registry of Vital Records and Statistics, MA Department of Public Health; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 48. Average Annual Crude Traumatic Brain Injury Hospitalization Rates by CHNA of Residence, FY1998-2002



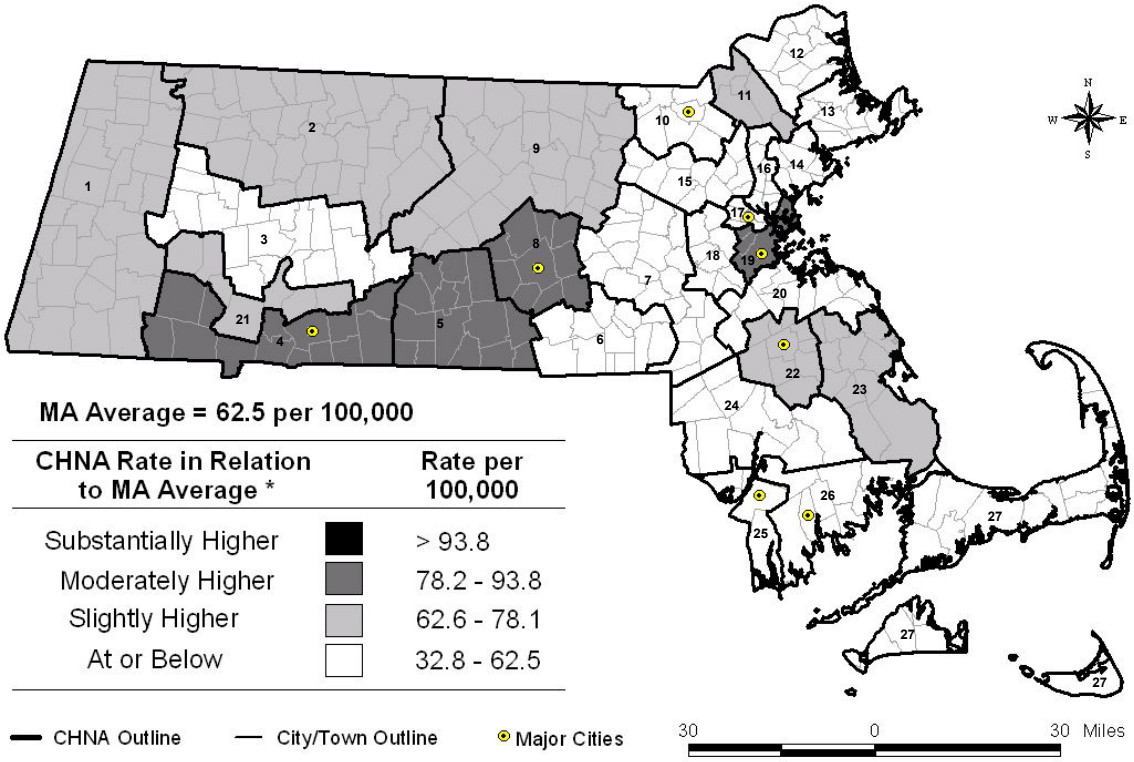
MA Average Number of Traumatic Brain Injury Hospitalizations = 3,973 per year

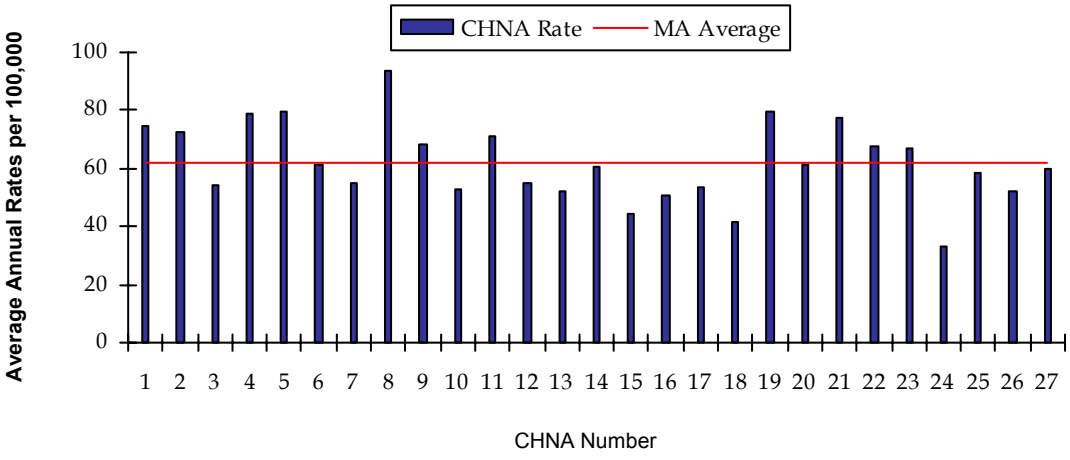


Data Sources: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

Figure 49. Average Annual Age-Adjusted Traumatic Brain Injury Hospitalization Rates by CHNA of Residence, FY1998-2002





Data Sources: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy; Massachusetts Executive Office of Environmental Affairs, MassGIS.

* Substantially Higher describes CHNA rates more than 1.5 times the MA average rate; Moderately Higher describes CHNA rates between 1.25 and 1.5 times the MA average rate; Slightly Higher describes CHNA rates between 1 and 1.25 times the MA average rate; At or Below describes CHNA rates at or below the MA average rate.

APPENDICES

Appendix A. CHNA Number by Massachusetts Towns

Town	CHNA
ABINGTON	22
ACTON	15
ACUSHNET	26
ADAMS	1
AGAWAM	4
ALFORD	1
AMESBURY	12
AMHERST	3
ANDOVER	11
AQUINNAH	27
ARLINGTON	17
ASHBURNHAM	9
ASHBY	9
ASHFIELD	2
ASHLAND	7
ATHOL	2
ATTLEBORO	24
AUBURN	8
AVON	22
AYER	9
BARNSTABLE	27
BARRE	9
BECKET	1
BEDFORD	15
BELCHERTOWN	3
BELLINGHAM	6
BELMONT	17
BERKLEY	24
BERLIN	9
BERNARDSTON	2
BEVERLY	13
BILLERICA	10
BLACKSTONE	6
BLANDFORD	4
BOLTON	9
BOSTON	19
BOURNE	27
BOXBOROUGH	15
BOXFORD	12
BOYLSTON	8
BRAINTREE	20
BREWSTER	27
BRIDGEWATER	22
BRIMFIELD	5
BROCKTON	22
BROOKFIELD	5
BROOKLINE	19
BUCKLAND	2
BURLINGTON	15
CAMBRIDGE	17
CANTON	20
CARLISLE	15
CARVER	23
CHARLEMONT	2
CHARLTON	5
CHATHAM	27
CHELMSFORD	10
CHELSEA	19
CHESHIRE	1
CHESTER	21
CHESTERFIELD	3
CHICOPEE	21
CHILMARK	27
CLARKSBURG	1
CLINTON	9
COHASSET	20
COLRAIN	2
CONCORD	15
CONWAY	2
CUMMINGTON	3
DALTON	1
DANVERS	14
DARTMOUTH	26
DEDHAM	18
DEERFIELD	2
DENNIS	27
DIGHTON	24
DOUGLAS	6
DOVER	18
DRACUT	10
DUDLEY	5
DUNSTABLE	10
DUXBURY	23
EAST BRIDGEWATER	22
EAST BROOKFIELD	5
EAST LONGMEADOW	4
EASTHAM	27
EASTHAMPTON	3
EASTON	22
EDGARTOWN	27
EGREMONT	1
ERVING	2
ESSEX	13
EVERETT	16
FAIRHAVEN	26
FALL RIVER	25
FALMOUTH	27
FITCHBURG	9
FLORIDA	1
FOXBOROUGH	7
FRAMINGHAM	7
FRANKLIN	6
FREETOWN	26
GARDNER	9
GEORGETOWN	12
GILL	2
GLOUCESTER	13
GOSHEN	3
GOSNOLD	27
GRAFTON	8
GRANBY	3
GRANVILLE	4
GREAT BARRINGTON	1
GREENFIELD	2
GROTON	9
GROVELAND	12
HADLEY	3
HALIFAX	23
HAMILTON	13
HAMPDEN	4
HANCOCK	1
HANOVER	23
HANSON	23
HARDWICK	9
HARVARD	9
HARWICH	27
HATFIELD	3
HAVERHILL	12
HAWLEY	2
HEATH	2
HINGHAM	20
HINSDALE	1
HOLBROOK	22
HOLDEN	8
HOLLAND	5
HOLLISTON	7
HOLYOKE	21
HOPEDALE	6
HOPKINTON	7
HUBBARDSTON	9
HUDSON	7
HULL	20
HUNTINGTON	21
IPSWICH	13
KINGSTON	23
LAKEVILLE	24
LANCASTER	9
LANESBOROUGH	1
LAWRENCE	11
LEE	1
LEICESTER	8
LENOX	1
LEOMINSTER	9
LEVERETT	2
LEXINGTON	15
LEYDEN	2
LINCOLN	15
LITTLETON	15
LONGMEADOW	4
LOWELL	10
LUDLOW	21
LUNENBURG	9
LYNN	14
LYNNFIELD	14
MALDEN	16
MANCHESTER	13
MANSFIELD	24
MARBLEHEAD	14
MARION	26
MARLBOROUGH	7
MARSHFIELD	23
MASHPEE	27
MATTAPOISETT	26
MAYNARD	7
MEDFIELD	7
MEDFORD	16
MEDWAY	6

Town	CHNA
MELROSE	16
MENDON	6
MERRIMAC	12
METHUEN	11
MIDDLEBOROUGH	24
MIDDLEFIELD	3
MIDDLETON	11
MILFORD	6
MILLBURY	8
MILLIS	7
MILLVILLE	6
MILTON	20
MONROE	2
MONSON	4
MONTAGUE	2
MONTEREY	1
MONTGOMERY**	21
MOUNT WASHINGTON	1
NAHANT	14
NANTUCKET	27
NATICK	7
NEEDHAM	18
NEW ASHFORD	1
NEW BEDFORD	26
NEW BRAINTREE	9
NEW MARLBOROUGH	1
NEW SALEM	2
NEWBURY	12
NEWBURYPORT	12
NEWTON	18
NORFOLK	7
NORTH ADAMS	1
NORTH ANDOVER	11
NORTH ATTLEBORO	24
NORTH BROOKFIELD	5
NORTH READING	16
NORTHAMPTON	3
NORTHBOROUGH	7
NORTHBRIDGE	6
NORTHFIELD	2
NORTON	24
NORWELL	20
NORWOOD	20
OAK BLUFFS	27
OAKHAM	9
ORANGE	2
ORLEANS	27
OTIS	1
OXFORD	5
PALMER	4
PAXTON	8
PEABODY	14
PELHAM	3
PEMBROKE	23
PEPPERELL	9
PERU	1
PETERSHAM	2
PHILLIPSTON	2
PITTSFIELD	1
PLAINFIELD	3
PLAINVILLE	7
PLYMOUTH	23
PLYMPTON	23
PRINCETON	9
PROVINCETOWN	27
QUINCY	20
RANDOLPH	20
RAYNHAM	24
READING	16
REHOBOTH	24
REVERE	19
RICHMOND	1
ROCHESTER	26
ROCKLAND	23
ROCKPORT	13
ROWE	2
ROWLEY	12
ROYALSTON	2
RUSSELL	4
RUTLAND	9
SALEM	14
SALISBURY	12
SANDISFIELD	1
SANDWICH	27
SAUGUS	14
SAVOY	1
SCITUATE	20
SEEKONK	24
SHARON	20
SHEFFIELD	1
SHELBURNE	2
SHERBORN	7
SHIRLEY	9
SHREWSBURY	8
SHUTESBURY	2
SOMERSET	25
SOMERVILLE	17
SOUTH HADLEY	3
SOUTHAMPTON	3
SOUTHBOROUGH	7
SOUTHBRIDGE	5
SOUTHWICK	4
SPENCER	5
SPRINGFIELD	4
STERLING	9
STOCKBRIDGE	1
STONEHAM	16
STOUGHTON	22
STOW	7
STURBRIDGE	5
SUDBURY	7
SUNDERLAND	2
SUTTON	6
SWAMPSCOTT	14
SWANSEA	25
TAUNTON	24
TEMPLETON	9
TEWKSBURY	10
TISBURY	27
TOLLAND	4
TOPSFIELD	13
TOWNSEND	9
TRURO	27
TYNGSBOROUGH	10
TYRINGHAM	1
UPTON	6
UXBRIDGE	6
WAKEFIELD	16
WALES	5
WALPOLE	7
WALTHAM	18
WARE	3
WAREHAM	26
WARREN	5
WARWICK	2
WASHINGTON	1
WATERTOWN	17
WAYLAND	7
WEBSTER	5
WELLESLEY	18
WELLFLEET	27
WENDELL	2
WENHAM	13
WEST BOYLSTON	8
WEST BRIDGEWATER	22
WEST BROOKFIELD	5
WEST NEWBURY	12
WEST SPRINGFIELD	4
WEST STOCKBRIDGE	1
WEST TISBURY	27
WESTBOROUGH	7
WESTFIELD	21
WESTFORD	10
WESTHAMPTON	3
WESTMINSTER	9
WESTON	18
WESTPORT	25
WESTWOOD	18
WEYMOUTH	20
WHATELY	2
WHITMAN	22
WILBRAHAM	4
WILLIAMSBURG	3
WILLIAMSTOWN	1
WILMINGTON	15
WINCHENDON	9
WINCHESTER	15
WINDSOR	1
WINTHROP	19
WOBURN	15
WORCESTER	8
WORTHINGTON	3
WRENTHAM	7
YARMOUTH	27

**Because Montgomery (CHNA 4) shares a zip code with Westfield (CHNA 21), Montgomery was included in CHNA 21 for the purposes of this report.

Appendix B. Resources

Injury Surveillance Program
Massachusetts Department of Public Health
www.mass.gov/dph/bhsre/isp/isp.htm
250 Washington Street, 6th Floor
Boston, MA 02108
phone: 617-624-5648
fax: 617-624-5099

Injury Prevention and Control Program
Massachusetts Department of Public Health
www.mass.gov/dph/fch/injury/index.htm
250 Washington Street, 4th Floor
Boston, MA 02108
phone: 617-624-5070
fax: 617-624-5075

Regional Centers for Healthy Communities
Massachusetts Department of Public Health
www.mass.gov/dph/ohc/reghealthcenters.htm
250 Washington Street, 2nd Floor
Boston, MA 02108
phone: 617-624-5276
fax: 617-624-5046

Massachusetts Partnership for Healthy Communities
www.tmfnet.org/partnership
622 Washington Street
Boston, MA 02124
phone: 617-451-0049
fax: 617-282-3950

Governor's Highway Safety Bureau
Massachusetts Department of Public Health
www.massghsb.com
One Ashburton Place, Room 611
Boston, MA 02108
phone: 617-727-4054 x25557
fax: 617-727-6137

Bureau of Substance Abuse Services
Massachusetts Department of Public Health
www.mass.gov/dph/bsas/bsas.htm
250 Washington Street, 3rd Floor
Boston, MA 02108
phone: 617-624-5486
fax: 617-624-5075

Massachusetts Substance Abuse Information and Education
www.helpline-online.com
95 Berkeley Street
Boston, MA 02116
phone:1-800-327-5050
fax: 617-536-8012

Region Center for Poison Control and Prevention
www.maripoisoncenter.org
300 Longwood Avenue
Boston, MA 02115
phone: 1-800-222-1222
fax: 617-738-0032

Suicide Prevention Resource Center
www.sprc.org
55 Chapel Street
Newton, MA 02458-1060
phone: 877-GET-SPRC (438-7772)

American Foundation for Suicide Prevention
www.afsp.org
Kimberly Gleason, Regional Director
56 Broad Street
Boston, MA 02109
phone: 617-439-0940
fax: 617-439-0338

The Samaritans
www.samaritansofboston.org
654 Beacon Street, 6th Floor
Boston, MA 02215
phone: 617-247-0220
fax: 617-247-0207

Massachusetts Violence Prevention Task Force
www.violenceprevention.com
250 Washington Street, 4th Floor
Boston, MA 02108
phone: 617-624-5486
fax: 617-624-5075

Stop Handgun Violence
www.stophandgunviolence.com
1 Bridge Street, Suite 300
Newton, MA 02458
phone: 877-SAFE-ARMS (723-3276)
fax: 617-965-7308

Office of Elder Health
Massachusetts Department of Public Health
www.mass.gov/dph/fch/elderhealth/index.htm
2 Boylston Street, 4th Floor
Boston, MA 02108
phone: 617-624-5070
fax: 617-624-5075

Massachusetts Brain Injury Association (MBIA)
www.mbia.net
484 Main Street #325
Worcester, MA 01608
phone: 508-795-0244
Brain Injury Information Line: 1-800-242-0300

Statewide Head Injury Program (SHIP)
www.state.ma.us/mrc/ship/ship.htm
The Massachusetts Rehabilitation Commission
27 Wormwood Street, Suite 600
Boston, MA 02210-1616
phone: 617-204-3600

National Center for Injury Prevention and Control
www.cdc.gov/ncipc/default.htm
Mailstop K65
4770 Buford Highway NE
Atlanta, GA 30341-3724
phone: 770-488-1506
fax: 770-488-1667

CHNA Contact Information

To contact a specific CHNA, please contact the Regional Center for Healthy Communities for each CHNA in a given region.

Western Massachusetts Center for Healthy Communities
[CHNAs 1, 2, 3, 21, and 4]
www.westernmasshealthycommunities.org
Cooley Dickinson Hospital.
489 Whitney Avenue, 2nd Floor
Holyoke, MA 01040
phone: 413-540-0600
fax: 413-540-0340

Central Massachusetts Center for Healthy Communities
[CHNAs 5, 6, 8, and 9]
www.cmchc.org
A Program of LUK, Inc.
44 Front Street, Suite 280
Worcester, MA 01608-1733
phone: 508-438-0515
fax: 508-438-0516

Northeast Center for Healthy Communities
[CHNAs 10, 11, 12, 13, 14, and 16]
www.nc4hc.org
A Program of the Greater Lawrence Family Health Center
101 Amesbury Street, Suite 405
Lawrence, MA 01840
phone: 978-688-2323
fax: 978-975-7779

Regional Center for Healthy Communities
[CHNAs 7, 15, 17, 18, and 20]
www.healthiercommunities.org
Mount Auburn Hospital, Center for Community Health
552 Massachusetts Avenue, Suite 203
Cambridge, MA 02139
phone: 617-441-0700
fax: 617-441-0555

Southeast Center for Health Communities
[CHNAs 22, 23, 24, 25, 26, and 27]
www.preventionwoks.org
A Program of Health Care of Southeastern Massachusetts, Inc.
942 West Chestnut Street
Brockton, MA 02301
phone: 508-583-2350 / 1-800-530-2770
fax: 508-583-2611

Greater Boston Center for Healthy Communities
[CHNA 19]
www.tmfnet.org/chc
A Program of the Medical Foundation
622 Washington Street, 2nd Floor
Dorchester, MA 02124-3548
phone: 617-423-4337
fax: 617-282-3950

Appendix C. Prevention

Falls

- Take your time. Get out of bed, a chair or car slowly. Stand and get your balance before walking.
- Engage in regular strength and balance training.
- Have your vision screened regularly.
- Wear sturdy, well-fitted, low-heeled shoes with non-slip soles. These are safer than high-heels, thick-soled athletic shoes or sneakers, slippers or stocking feet.
- Modify your home to eliminate hazards. If you must use throw rugs, use only throw rugs with rubber, non-skid backing. Remove clutter, install grab bars next to the toilet and in the tub or shower, and improve lighting and visibility.

Poisonings

- Avoid confusion: keep potential poisons in their original containers. DO NOT use food containers to store household and chemical products.
- Read and follow the directions and caution labels on household products before using them.
- Never mix chemical products together. A poisonous gas may be created.
- Keep medicines and household products locked up, where children cannot see or reach them, and use child-resistant packaging.
- Read the label and follow the directions on medicines and products.
- Poisons can look like food or drink; teach children to ask an adult before eating or drinking anything.
- Turn on fans and open windows when using household and chemical products.
- Never sniff containers to discover what is inside.
- Stay away from areas that have been recently sprayed with pesticides.
- Never take medicines in the dark and do not share prescription medicines.
- Discard outdated medicines; some medication can become dangerous over time.
- Keep the number of the Poison Control Center on or near your phone.

Motor Vehicle Traffic

- Always wear your seat belt. Seat belts reduce your risk of death or serious injury in a motor vehicle crash by up to 50%.
- Make sure that children under age 8 are properly restrained in a federally approved child safety seat.

- Always walk on the sidewalk. If there is no sidewalk, walk on the left side of the road, facing traffic. Stay alert for cars pulling out of driveways and side streets.
- When walking, jogging, or bicycling at night, wear a reflective vest or reflective stripes and carry a small flashlight.
- Avoid driving when fatigued. Get a good night sleep the night before. Schedule an over-night rest stop rather than driving straight through. On long trips, take a break every two hours to get some exercise or to take a nap.
- Obey the speed limit. Driving too fast reduces a driver's ability to steer safely around curves or obstacles in the roadway and extends the distance necessary to stop a vehicle in a dangerous situation.

Firearms

- Always point the muzzle in a safe direction; never point a firearm at another person.
- Keep your finger off the trigger and outside the trigger guard until you are ready to shoot.
- Do not operate a firearm after drinking or when you are cold or tired.
- Safeguard your sight and hearing: always wear eye and ear protection.
- Never shoot at a hard surface or at water. The shot could ricochet and injury you or a bystander.
- Make sure a firearm is in good mechanical condition before firing it. Have your firearm periodically checked for signs of erosion, cracking or wear by a qualified armorer.
- Make sure all accessories, such as holsters or grips, are compatible with the firearm.
- Teach children to never touch or play with a gun or ammunition. If they see ammunition, a gun, or anything that looks like a gun, they should leave the area and tell a grown-up immediately.
- If you have firearms in your home, keep them unloaded. Lock guns and ammunition in separate locations out of children's sight and reach.

Suffocation

- Take your time when eating and be sure to thoroughly chew food before swallowing.
- Avoid drinking alcohol in excess before or during a meal. Alcohol consumption dulls the nerves that aid in swallowing.
- Do not eat when walking, running, driving, or moving around.
- Always supervise young children while they're eating or playing. Don't allow children under age 6 to eat round or hard foods like peanuts, other nuts, raw carrots, popcorn, seeds or hard candy.
- Look for safety labels to make sure that children play with age appropriate toys.

- Remove hood and neck drawstrings from all children's outerwear. To prevent strangulation, never allow children to wear necklaces, purses, scarves or clothing with drawstrings while on playgrounds.
- Dispose of (or keep away from children) all plastic bags to prevent children from pulling them over their heads.

Traumatic Brain Injury

- Wear a seat belt every time you drive or ride in a car, and make sure that children under 8 years old are properly restrained in a federally approved child safety seat.
- Always wear a bike helmet when riding a bike, a scooter, a skateboard or when using rollerblades. Bike helmets, when worn correctly, are 85% effective in preventing brain injuries.
- Make sure to use only helmets that meet the standards of the U.S. Consumer Product Safety Commission (CPSC), American Society for the Testing and Materials (ASTM), Snell Memorial Foundation, or the American National Standards Institute.
- Keep bullets and firearms stored in a locked cabinet when not in use and avoid pointing the muzzle at another person or at yourself.
- Make sure the surface of your child’s playground is made with shock-absorbing materials (e.g. hardwood mulch, sand).
- Use a step-stool to reach objects on high shelves, and use handrails when climbing stairs.

Appendix D. Total Number of Injury Deaths and Average Annual Rates per 100,000 Massachusetts Residents by CHNA**, 1992-2001

	Total			Unintentional			Suicide		
CHNA	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate
1	589	42.7	40.0	414	30.0	27.6	126	9.1	9.0
2	396	45.6	44.9	242	27.9	27.4	100	11.5	11.4
3	510	33.3	35.7	309	20.2	21.8	117	7.6	8.1
4	1,258	42.5	42.5	656	22.2	22.2	244	8.3	8.3
5	469	41.4	41.4	288	25.4	25.6	104	9.2	9.1
6	459	29.8	31.5	269	17.5	19.1	109	7.1	7.2
7	1,009	26.8	27.7	608	16.2	17.3	230	6.1	6.0
8	1,237	43.7	42.9	618	21.8	21.3	215	7.6	7.6
9	948	36.5	37.8	552	21.2	22.8	184	7.1	7.1
10	944	34.5	35.7	494	18.0	19.7	204	7.5	7.4
11	657	36.3	36.8	320	17.7	18.0	113	6.2	6.3
12	498	34.8	35.5	289	20.2	21.4	113	7.9	7.7
13	428	35.7	34.0	242	20.2	18.9	111	9.3	9.0
14	1,081	38.5	36.7	556	19.8	18.6	199	7.1	6.8
15	564	25.9	25.3	345	15.9	15.6	132	6.1	5.8
16	947	36.4	34.3	514	19.8	18.1	189	7.3	7.1
17	579	20.9	20.3	321	11.6	11.6	127	4.6	4.5
18	663	25.5	23.9	401	15.4	14.1	146	5.6	5.5
19	3,544	48.6	51.0	1,450	19.9	22.6	601	8.2	8.5
20	1,371	37.3	35.3	767	20.9	19.5	304	8.3	8.0
21	741	47.2	45.8	414	26.4	25.0	132	8.4	8.3
22	969	40.8	41.2	495	20.8	21.6	187	7.9	7.8
23	565	31.0	32.5	352	19.3	20.8	117	6.4	6.4
24	881	36.8	37.8	515	21.5	22.7	171	7.1	7.1
25	675	48.3	46.2	325	23.3	21.2	99	7.1	7.1
26	837	41.6	40.7	427	21.2	20.1	148	7.4	7.3
27	1,088	46.7	40.9	688	29.5	24.1	211	9.1	8.5
MA Average	2,391	37.6	37.0	1,287	20.2	20.1	473	7.4	7.3

** Rates based on numbers less than 20 may be unstable and should be interpreted with caution.
Data Source: Registry of Vital Records and Statistics, MA Department of Public Health.

Appendix D. Total Number of Injury Deaths and Average Annual Rates per 100,000 Massachusetts Residents by CHNA**, 1992-2001 (continued)

	Homicide			Undetermined			Fall		
CHNA	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate
1	8	0.6	0.6	26	1.9	1.9	64	4.6	3.9
2	10	1.2	1.2	37	4.3	4.1	41	4.7	4.4
3	10	0.7	0.6	63	4.1	4.3	40	2.6	2.9
4	143	4.8	4.7	199	6.7	6.7	77	2.6	2.6
5	19	1.7	1.7	50	4.4	4.3	39	3.4	3.5
6	14	0.9	0.9	53	3.4	3.3	31	2.0	2.4
7	39	1.0	1.0	109	2.9	2.7	79	2.1	2.3
8	101	3.6	3.5	278	9.8	9.7	114	4.0	3.9
9	36	1.4	1.4	161	6.2	5.8	71	2.7	3.1
10	59	2.2	2.1	171	6.2	5.9	81	3.0	3.4
11	72	4.0	3.9	140	7.7	7.8	51	2.8	2.9
12	20	1.4	1.4	66	4.6	4.3	45	3.1	3.4
13	14	1.2	1.1	55	4.6	4.6	48	4.0	3.7
14	79	2.8	2.8	222	7.9	7.6	91	3.2	3.0
15	13	0.6	0.6	65	3.0	2.8	70	3.2	3.2
16	49	1.9	1.9	179	6.9	6.5	98	3.8	3.4
17	18	0.6	0.6	99	3.6	3.0	67	2.4	2.3
18	24	0.9	0.9	75	2.9	2.8	90	3.5	3.1
19	675	9.3	8.7	761	10.4	10.3	315	4.3	5.0
20	51	1.4	1.4	229	6.2	6.0	151	4.1	3.7
21	56	3.6	3.5	130	8.3	8.4	66	4.2	3.9
22	91	3.8	3.8	183	7.7	7.5	74	3.1	3.3
23	20	1.1	1.1	69	3.8	3.7	45	2.5	2.8
24	38	1.6	1.6	143	6.0	5.6	63	2.6	3.0
25	37	2.6	2.6	199	14.2	14.4	74	5.3	4.6
26	57	2.8	2.9	191	9.5	9.8	52	2.6	2.3
27	34	1.5	1.6	141	6.0	6.4	128	5.5	3.6
MA Average	179	2.8	2.8	409	6.4	6.2	217	3.4	3.4

** Rates based on numbers less than 20 may be unstable and should be interpreted with caution.
Data Source: Registry of Vital Records and Statistics, MA Department of Public Health.

Appendix D. Total Number of Injury Deaths and Average Annual Rates per 100,000 Massachusetts Residents by CHNA**, 1992-2001 (continued)

	Poisoning			Motor Vehicle Traffic			Firearm		
CHNA	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate
1	80	5.8	5.8	163	11.8	11.6	50	3.6	3.4
2	45	5.2	5.0	104	12.0	12.2	54	6.2	6.1
3	84	5.5	5.8	111	7.2	7.5	48	3.1	3.4
4	248	8.4	8.4	271	9.2	9.2	180	6.1	6.1
5	80	7.1	6.9	148	13.1	13.1	61	5.4	5.4
6	91	5.9	5.7	127	8.2	8.6	31	2.0	2.1
7	166	4.4	4.2	251	6.7	6.8	80	2.1	2.1
8	356	12.6	12.4	230	8.1	8.0	109	3.8	3.8
9	204	7.8	7.5	224	8.6	8.8	84	3.2	3.3
10	227	8.3	7.9	227	8.3	8.4	72	2.6	2.7
11	163	9.0	9.2	130	7.2	7.2	77	4.3	4.2
12	104	7.3	6.9	124	8.7	8.7	42	2.9	3.0
13	86	7.2	7.0	66	5.5	5.5	38	3.2	3.1
14	288	10.2	9.9	189	6.7	6.6	88	3.1	3.1
15	97	4.5	4.2	128	5.9	5.8	40	1.8	1.8
16	243	9.4	8.9	152	5.9	5.7	73	2.8	2.8
17	139	5.0	4.4	82	3.0	3.0	29	1.0	1.1
18	130	5.0	4.9	107	4.1	3.9	34	1.3	1.3
19	851	11.7	11.7	445	6.1	6.4	554	7.6	7.1
20	301	8.2	7.9	246	6.7	6.5	115	3.1	3.0
21	153	9.7	9.7	156	9.9	9.9	85	5.4	5.4
22	224	9.4	9.2	213	9.0	9.0	96	4.0	4.0
23	96	5.3	5.2	168	9.2	9.4	60	3.3	3.4
24	175	7.3	7.0	257	10.7	10.9	86	3.6	3.6
25	226	16.2	16.2	135	9.7	9.5	37	2.6	2.6
26	214	10.6	11.0	197	9.8	9.6	64	3.2	3.2
27	198	8.5	8.7	242	10.4	10.3	86	3.7	3.4
MA Average	527	8.3	8.0	489	7.7	7.6	237	3.7	3.7

** Rates based on numbers less than 20 may be unstable and should be interpreted with caution.
Data Source: Registry of Vital Records and Statistics, MA Department of Public Health.

Appendix D. Total Number of Injury Deaths and Average Annual Rates per 100,000 Massachusetts Residents by CHNA**, 1992-2001 (continued)

	Suffocation			Traumatic Brain Injury		
CHNA	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate
1	71	5.2	5.0	162	11.8	10.7
2	42	4.8	4.9	116	13.4	13.1
3	56	3.7	4.0	117	7.6	8.2
4	131	4.4	4.4	287	9.7	9.7
5	30	2.6	2.6	100	8.8	8.9
6	56	3.6	4.0	105	6.8	7.4
7	136	3.6	3.7	251	6.7	7.0
8	134	4.7	4.7	256	9.0	8.8
9	112	4.3	4.4	221	8.5	9.0
10	95	3.5	3.5	226	8.3	9.0
11	78	4.3	4.4	144	8.0	8.1
12	49	3.4	3.5	132	9.2	9.6
13	56	4.7	4.5	119	9.9	9.4
14	118	4.2	4.0	247	8.8	8.3
15	71	3.3	3.2	144	6.6	6.5
16	116	4.5	4.2	196	7.5	7.0
17	97	3.5	3.5	127	4.6	4.5
18	88	3.4	3.2	169	6.5	6.0
19	421	5.8	6.2	760	10.4	11.2
20	164	4.5	4.3	331	9.0	8.5
21	73	4.6	4.5	170	10.8	10.4
22	126	5.3	5.4	191	8.0	8.2
23	61	3.3	3.5	154	8.5	9.0
24	94	3.9	4.1	216	9.0	9.4
25	71	5.1	4.8	142	10.2	9.2
26	86	4.3	4.2	166	8.3	8.0
27	109	4.7	4.3	281	12.1	9.9
MA Average	274	4.3	4.2	553	8.7	8.6

** Rates based on numbers less than 20 may be unstable and should be interpreted with caution.
Data Source: Registry of Vital Records and Statistics, MA Department of Public Health.

Appendix E. Total Number of Injury Hospitalizations and Average Annual Rates per 100,000 Massachusetts Residents by CHNA**, 1998-2002

	Total			Unintentional			Self-inflicted		
CHNA	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate
1	7,587	1,100.9	991.2	5,942	862.2	760.4	517	75.0	78.3
2	3,786	872.3	848.4	2,937	676.7	653.8	413	95.2	96.3
3	5,092	664.8	717.3	3,850	502.7	547.5	446	58.2	58.3
4	12,353	835.6	838.7	9,216	623.4	626.4	1,094	74.0	73.6
5	4,708	831.1	838.6	3,895	687.6	695.1	231	40.8	40.3
6	4,548	590.8	659.7	3,782	491.3	552.7	158	20.5	20.0
7	11,955	636.0	680.8	9,622	511.9	552.2	662	35.2	34.5
8	12,126	855.9	839.6	9,793	691.2	676.6	638	45.0	44.8
9	9,264	712.9	758.0	6,928	533.1	573.3	747	57.5	55.3
10	8,371	611.7	673.1	6,341	463.4	519.7	723	52.8	50.9
11	6,635	733.8	749.3	5,198	574.9	590.1	587	64.9	64.7
12	5,421	757.6	810.3	3,946	551.4	597.3	458	64.0	61.1
13	4,585	764.8	712.0	3,455	576.3	530.6	361	60.2	60.6
14	11,954	850.7	800.8	8,871	631.3	588.4	1,091	77.6	77.1
15	6,698	616.0	611.5	5,342	491.3	487.5	367	33.8	33.5
16	10,750	827.4	764.4	8,560	658.8	603.1	693	53.3	52.1
17	9,813	708.1	720.1	7,598	548.2	557.8	641	46.3	45.8
18	8,567	658.2	608.9	7,039	540.8	496.6	333	25.6	25.9
19	32,298	885.4	986.0	23,836	653.4	746.4	2,239	61.4	59.8
20	16,316	888.6	827.9	13,309	724.9	670.5	871	47.4	47.2
21	7,138	908.7	855.7	5,220	664.5	618.5	576	73.3	74.2
22	9,457	795.8	827.2	7,399	622.6	652.7	817	68.8	67.0
23	6,665	731.5	792.6	5,450	598.1	653.8	408	44.8	44.9
24	6,513	544.6	590.1	5,303	443.4	484.7	322	26.9	25.9
25	6,349	908.7	799.0	5,046	722.2	623.0	455	65.1	66.1
26	7,803	776.4	715.3	6,426	639.4	580.0	586	58.3	59.7
27	11,523	988.4	782.0	9,662	828.8	637.0	559	48.0	51.3
MA Average	49,655	780.7	776.5	38,793	609.9	607.3	3,399	53.4	52.4

** Rates based on numbers less than 20 may be unstable and should be interpreted with caution.
Data Source: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy.

Appendix E. Total Number of Injury Hospitalizations and Average Annual Rates per 100,000 Massachusetts Residents by CHNA**, 1998-2002 (continued)

	Assault			Fall			Poisoning		
CHNA	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate
1	149	21.6	22.7	3,456	501.5	418.4	610	88.5	90.9
2	76	17.5	17.7	1,744	401.8	383.2	422	97.2	97.3
3	67	8.7	8.6	2,236	291.9	326.9	548	71.5	72.6
4	499	33.8	33.4	4,921	332.9	334.9	1,500	101.5	101.5
5	86	15.2	15.1	2,277	402.0	409.3	329	58.1	57.6
6	47	6.1	5.9	2,162	280.9	334.4	266	34.6	34.9
7	139	7.4	7.3	5,792	308.1	342.7	917	48.8	48.8
8	428	30.2	29.8	5,728	404.3	391.1	995	70.2	70.0
9	159	12.2	12.0	3,951	304.0	339.2	910	70.0	68.9
10	203	14.8	14.3	3,609	263.7	312.3	950	69.4	68.4
11	285	31.5	30.8	2,932	324.3	336.7	684	75.6	75.6
12	62	8.7	8.4	2,382	332.9	373.5	601	84.0	81.6
13	50	8.3	8.5	2,290	382.0	341.9	431	71.9	71.9
14	268	19.1	19.4	5,575	396.7	359.3	1,353	96.3	95.0
15	62	5.7	5.8	3,499	321.8	319.0	468	43.0	43.0
16	228	17.5	17.7	5,546	426.9	380.1	982	75.6	74.3
17	254	18.3	18.3	4,936	356.2	362.2	905	65.3	65.7
18	73	5.6	5.7	4,845	372.3	334.0	506	38.9	38.4
19	2,573	70.5	67.5	13,327	365.3	435.5	3,416	93.6	96.2
20	292	15.9	16.2	8,755	476.8	431.2	1,241	67.6	66.7
21	200	25.5	25.4	2,975	378.7	340.1	835	106.3	107.3
22	334	28.1	27.6	4,094	344.5	369.8	1,099	92.5	91.0
23	107	11.7	11.7	3,172	348.1	395.3	546	59.9	60.6
24	86	7.2	7.0	3,015	252.1	287.7	455	38.0	37.4
25	112	16.0	16.0	3,352	479.7	396.6	562	80.4	80.5
26	228	22.7	23.5	3,816	379.7	329.5	786	78.2	79.1
27	140	12.0	13.5	6,264	537.3	367.0	816	70.0	71.4
MA Average	7,207	22.7	22.4	23,330	366.8	364.9	4,627	72.7	71.7

** Rates based on numbers less than 20 may be unstable and should be interpreted with caution.

Data Source: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy.

Appendix E. Total Number of Injury Hospitalizations and Average Annual Rates per 100,000 Massachusetts Residents by CHNA**, 1998-2002 (continued)

	Motor Vehicle Traffic			Traumatic Brain Injury		
CHNA	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate
1	554	80.4	79.4	545	79.1	74.4
2	368	84.8	84.7	316	72.8	72.3
3	447	58.4	60.0	395	51.6	53.9
4	1,253	84.8	84.6	1,167	78.9	78.9
5	551	97.3	97.3	448	79.1	79.5
6	437	56.8	57.9	443	57.6	61.4
7	1,035	55.1	55.9	977	52.0	55.0
8	1,268	89.5	88.7	1,346	95.0	93.7
9	934	71.9	72.4	856	65.9	68.6
10	853	62.3	62.8	678	49.5	53.1
11	658	72.8	72.9	636	70.3	71.0
12	415	58.0	58.7	371	51.8	54.6
13	288	48.0	47.2	329	54.9	52.1
14	1,040	74.0	73.2	878	62.5	60.8
15	467	42.9	42.8	482	44.3	44.6
16	769	59.2	57.8	686	52.8	51.0
17	662	47.8	48.4	711	51.3	53.5
18	531	40.8	39.7	579	44.5	41.9
19	2,648	72.6	75.4	2,671	73.2	79.9
20	1,199	65.3	64.0	1,179	64.2	61.5
21	561	71.4	71.1	628	79.9	77.4
22	1,024	86.2	86.6	778	65.5	67.5
23	764	83.8	85.6	574	63.0	67.0
24	678	56.7	57.5	372	31.1	32.8
25	450	64.4	62.4	463	66.3	58.4
26	697	69.4	68.7	558	55.5	52.4
27	1,015	87.1	85.5	799	68.5	59.6
Ma Average	4,313	67.8	67.6	3,973	62.5	62.5

** Rates based on numbers less than 20 may be unstable and should be interpreted with caution.
Data Source: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy.

Appendix F. CHNA Rank of Injury Deaths and Average Annual Rates**, 1992-2001

	Total			Unintentional			Suicide		
CHNA	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate
1	10	21	17	13.5	27	27	10	23.5	24.5
2	1	23	24	1.5	25	26	2	27	27
3	6	7	11.5	6	13	18	8.5	15.5	19
4	25	20	22	24	21	19	25	20.5	20.5
5	4	18	21	4	23	25	3	25	26
6	3	5	5	3	5	9	4	9	12
7	21	4	4	22	4	4	24	3.5	4
8	24	22	23	23	20	15	23	15.5	15
9	19	13	15.5	20	17.5	22	17	9	9.5
10	17	8	11.5	16	7	11	21	14	14
11	11	11	14	7	6	5	6.5	5	5
12	5	9	10	5	13	16	6.5	17.5	16
13	2	10	7	1.5	13	8	5	26	24.5
14	22	16	13	21	9.5	7	20	9	7
15	7	3	3	10	3	3	12.5	3.5	3
16	18	12	8	18	9.5	6	19	12	9.5
17	9	1	1	8	1	1	11	1	1
18	12	2	2	12	2	2	14	2	2
19	27	27	27	27	11	20	27	19	22.5
20	26	15	9	26	16	10	26	20.5	18
21	14	25	25	13.5	24	24	12.5	22	20.5
22	20	17	20	17	15	17	18	17.5	17
23	8	6	6	11	8	13	8.5	6	6
24	16	14	15.5	19	19	21	16	9	9.5
25	13	26	26	9	22	14	1	9	9.5
26	15	19	18	15	17.5	12	15	13	13
27	23	24	19	25	26	23	22	23.5	22.5

** Rates are ranked from lowest (1) to highest (27). Ties resulted in ranks being averaged.

Appendix F. CHNA Rank of Injury Deaths and Average Annual Rates**, 1992-2001 (continued)

	Homicide			Undetermined			Fall		
CHNA	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate
1	1	2	2.5	1	1	1	11	24	23
2	2.5	9.5	10	2	9	8	4	25	25
3	2.5	4	2.5	6	8	10	3	6.5	7.5
4	26	26	26	22.5	18	19	18	6.5	5
5	8	16	16	3	10	10	2	16	18
6	5.5	5.5	5.5	4	5	6	1	1	4
7	16	7	7	12	2.5	2	19	2	2
8	25	22.5	22.5	26	25	24	24	19.5	23
9	13	12	12	17	16	14	15	9	11.5
10	21	18	18	18	16	15	20	11	16
11	22	25	25	14	20.5	22	8	10	7.5
12	9.5	12	12	8	11.5	10	5.5	12.5	16
13	5.5	9.5	8.5	5	11.5	12	7	19.5	20.5
14	23	20.5	20	24	22	21	22	14.5	9.5
15	4	2	2.5	7	4	3.5	14	14.5	13
16	17	17	17	19	19	18	23	18	16
17	7	2	2.5	11	6	5	13	3	2
18	11	5.5	5.5	10	2.5	3.5	21	17	11.5
19	27	27	27	27	26	26	27	23	27
20	18	12	12	25	16	16	26	21	20.5
21	19	22.5	22.5	13	23	23	12	22	23
22	24	24	24	20	20.5	20	16.5	12.5	14
23	9.5	8	8.5	9	7	7	5.5	4	6
24	15	15	14.5	16	13.5	13	10	6.5	9.5
25	14	19	19	22.5	27	27	16.5	26	26
26	20	20.5	21	21	24	25	9	6.5	2
27	12	14	14.5	15	13.5	17	25	27	19

** Rates are ranked from lowest (1) to highest (27). Ties resulted in ranks being averaged.

Appendix F. CHNA Rank of Injury Deaths and Average Annual Rates**, 1992-2001 (continued)

	Poisoning			Motor Vehicle Traffic			Firearm		
CHNA	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate
1	2.5	8	8.5	14	25	25	9	17.5	16.5
2	1	5	5	3	26	26	10	26	25.5
3	4	7	8.5	5	10.5	11	8	11	16.5
4	23	17	17	26	18.5	18	26	25	25.5
5	2.5	10	10.5	11	27	27	12	23.5	23.5
6	6	9	7	7	13	14	2	4	4.5
7	14	1	1.5	24	8	9	17	5	4.5
8	26	26	26	21	12	12	24	20	20
9	17	14	14	19	15	16	18	14	14
10	21	16	15.5	20	14	13	14	6.5	7
11	13	19	20.5	9	10.5	10	16	22	22
12	9	12.5	10.5	6	16	15	7	9	9.5
13	5	11	12.5	1	3	3	5	14	11.5
14	24	23	23	16	8	8	22	11	11.5
15	8	2	1.5	8	4.5	5	6	3	3
16	22	20.5	19	12	4.5	4	15	8	8
17	11	3.5	3	2	1	1	1	1	1
18	10	3.5	4	4	2	2	3	2	2
19	27	25	25	27	6	6	27	27	27
20	25	15	15.5	23	8	7	25	11	9.5
21	12	22	22	13	22	22	19	23.5	23.5
22	19	20.5	20.5	18	17	17	23	21	21
23	7	6	6	15	18.5	19	11	16	16.5
24	15	12.5	12.5	25	24	24	20.5	17.5	19
25	20	27	27	10	20	20	4	6.5	6
26	18	24	24	17	21	21	13	14	13
27	16	18	18	22	23	23	20.5	19	16.5

** Rates are ranked from lowest (1) to highest (27). Ties resulted in ranks being averaged.

Appendix F. CHNA Rank of Injury Deaths and Average Annual Rates**, 1992-2001 (continued)

	Suffocation			Traumatic Brain Injury		
CHNA	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate
1	9	25	25	12	25	25
2	2	23	24	3	27	27
3	5	10	10	4	7	9.5
4	23	16	18	25	20	22
5	1	1	1	1	14.5	14
6	5	8.5	10	2	5	6
7	25	8.5	8	22	4	4.5
8	24	21	22	23	17	13
9	19	14	18	19	12.5	16
10	16	6.5	5.5	20	10.5	16
11	12	14	18	9.5	8.5	8
12	3	4.5	5.5	7	19	21
13	5	21	20.5	5	21	19.5
14	21	12	10	21	14.5	11
15	9	2.5	2.5	9.5	3	3
16	20	17.5	13.5	17	6	4.5
17	17	6.5	5.5	6	1	1
18	14	4.5	2.5	14	2	2
19	27	27	27	27	23	26
20	26	17.5	15.5	26	17	12
21	11	19	20.5	15	24	24
22	22	26	26	16	8.5	9.5
23	7	2.5	5.5	11	12.5	16
24	15	11	12	18	17	19.5
25	9	24	23	8	22	18
26	13	14	13.5	13	10.5	7
27	18	21	15.5	24	26	23

** Rates are ranked from lowest (1) to highest (27). Ties resulted in ranks being averaged.

Appendix G. CHNA Rank of Injury Hospitalizations and Average Annual Rates**, 1998-2002

	Total			Unintentional			Self-inflicted		
CHNA	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate
1	13	27	27	13	27	27	12	25	26
2	1	21	24	1	21	21.5	8	27	27
3	5	7	9	4	5	6	9	15	15
4	25	18	22	22	15	18	26	24	23
5	4	17	21	5	22	25	2	6	6
6	2	2	4	3	3.5	8	1	1	1
7	23	5	6	23	6	7	19	5	5
8	24	20	23	25	23	24	17	8	7
9	17	9	12	16	7	10	22	14	14
10	15	3	5	14	2	4	21	12	11
11	9	11	11	8	11	13	16	20	20
12	6	12	18	6	10	14	11	19	19
13	3	13	7	2	12	5	5	17	18
14	22	19	17	21	16	12	25	26	25
15	11	4	3	11	3.5	2	6	4	4
16	20	16	13	20	19	15	20	13	13
17	19	8	10	19	9	9	18	9	9
18	16	6	2	17	8	3	4	2	2.5
19	27	22	26	27	18	26	27	18	17
20	26	23	20	26	25	23	24	10	10
21	12	24.5	25	9	20	16	14	23	24
22	18	15	19	18	14	20	23	22	22
23	10	10	15	12	13	21.5	7	7	8
24	8	1	1	10	1	1	3	3	2.5
25	7	24.5	16	7	24	17	10	21	21
26	14	14	8	15	17	11	15	16	16
27	21	26	14	24	26	19	13	11	12

** Rates are ranked from lowest (1) to highest (27). Ties resulted in ranks being averaged.

Appendix G. CHNA Rank of Injury Hospitalizations and Average Annual Rates**, 1998-2002 (continued)

	Assault			Fall			Poisoning		
CHNA	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate
1	14	20	20	12	26	25	12	21	21
2	7	16.5	16.5	1	20	20	3	25	25
3	5	7.5	8	3	4	4	9	14	15
4	26	26	26	19	9.5	8	26	26	26
5	8.5	13	13	4	21	24	2	6	6
6	1	3	3	2	3	7	1	1	1
7	12	5	5	24	6	13	19	5	5
8	25	24	24	23	22	21	22	13	12
9	15	11	10	16	5	10	18	11.5	11
10	17	12	12	14	2	2	20	10	10
11	22	25	25	7	8	9	13	16.5	17
12	3.5	7.5	6	6	9.5	18	11	20	20
13	2	6	7	5	18	12	4	15	14
14	21	19	19	22	19	14	25	24	23
15	3.5	2	2	13	7	3	6	4	4
16	18.5	16.5	16.5	21	23	19	21	16.5	16
17	20	18	18	20	13	15	17	8	8
18	6	1	1	18	15	6	7	3	3
19	27	27	27	27	14	27	27	23	24
20	23	14	15	26	24	26	24	9	9
21	16	22	22	8	16	11	16	27	27
22	24	23	23	17	11	17	23	22	22
23	10	9	9	10	12	22	8	7	7
24	8.5	4	4	9	1	1	5	2	2
25	11	15	14	11	25	23	10	19	19
26	18.5	21	21	15	17	5	14	18	18
27	13	10	11	25	27	16	15	11.5	13

** Rates are ranked from lowest (1) to highest (27). Ties resulted in ranks being averaged.

Appendix G. CHNA Rank of Injury Hospitalizations and Average Annual Rates**, 1998-2002 (continued)

	Motor Vehicle Traffic			Traumatic Brain Injury		
CHNA	N	Crude Rate	Adjusted Rate	N	Crude Rate	Adjusted Rate
1	10	20	20	10	24.5	22
2	2	22.5	22	1	21	21
3	5	9	10	5	6	9
4	25	22.5	21	24	23	24
5	9	27	27	7	24.5	25
6	4	7	8	6	12	15
7	22	5	5	23	8	11
8	26	26	26	26	27	27
9	19	16	16	21	17	19
10	18	11	12	16	4	7
11	12	18	17	15	20	20
12	3	8	9	3	7	10
13	1	4	3	2	10	5
14	23	19	18	22	13	14
15	7	2	2	9	2	3
16	17	10	7	17	9	4
17	13	3	4	18	5	8
18	8	1	1	13	3	2
19	27	17	19	27	22	26
20	24	13	13	25	15	16
21	11	15	15	14	26	23
22	21	24	25	19	16	18
23	16	21	24	12	14	17
24	14	6	6	4	1	1
25	6	12	11	8	18	12
26	15	14	14	11	11	6
27	20	25	23	20	19	13

** Rates are ranked from lowest (1) to highest (27). Ties resulted in ranks being averaged.

ICD-9

Mechanism/ Cause	Manner/Intent				
	Unintentional	**Self-inflicted**	**Assault**	**Undetermined**	**Other**
Fall	E880.0-E886.9, E888	E957.0-.9	E968.1	E987.0-.9	
Firearm	E922.0-.3,.8, .9	E955.0-.4	E965.0-4, **E979.4**	E985.0-.4	E970
Motor vehicle traffic	E810-E819 (.0-.9)	E958.5	**E968.5**	E988.5	
Poisoning	E850.0-E869.9	E950.0-E952.9	E962.0-.9	E980.0-E982.9	E972
Suffocation	E911-E913.9	E953.0-.9	E963	E983.0-.9	
All injury	E800-E869, E880-E929	E950-E959	E960-E969, **E979**	E980-E989	E970-E978, E990-E999

ICD-10

Mechanism/ Cause	Manner/Intent				
	Unintentional	**Self-inflicted**	**Assault**	**Undetermined**	**Other**
Fall	W00-W19	X80	Y01	Y30	
Firearm	W32-W34	X72-X74	X93-X95	Y26-Y27	Y36.3
Motor vehicle traffic	V30-V79 (.4-.9), V81.1, V82.1, V83-V86 (.0-.3), V20-V28 (.3-.9), V29 (.4-.9), V12-V14 (.3-.9), V19 (.4-.6), V02-V04 (.1, .9), V09.2, V80 (.3-.5), V87 (.0-.8), V89.2				
Poisoning	X40-X49	X60-X69	X85-X90	Y10-Y19	Y35.2
Suffocation	W75-W84	X70	X91	Y20	
All injury	V01-X59, Y85-Y86	X60-X84, Y87.0	X85-Y09, Y87.1	Y10-Y34, Y87.2, Y89.9	Y35-Y36, Y89 (.0, .1)